DEMOGRAPHIC AND SOCIAL FACTORS IN THE PREDICTION OF REOFFENDING.

A Thesis submitted in partial fulfillment of the requirements for the Degree of Master of Arts in Psychology in the University of Canterbury.

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ABSTRACT

296 subjects, who were convicted of a criminal offence in the Christchurch District Court, during June to July in 1986, were asked by their Probation Officer to fill in a Social History and Demographic Questionnaire. The Questionnaire gathered information on the subjects age, sex, race, offending history, family and work stability and status, and substance abuse. The results from the Questionnaire are compared with the subjects offending behaviour within in a twelve month follow up period from when the Questionnaire was completed.

Using discriminant analysis a number of interesting trends emerge from the data with respect to reoffending. Most notably was the impact that increased age has on reoffending, giving weight to the theory that offenders tend to burnout with age. Different variables appear to be operating between the sexes and reoffending; for females, interpersonal variables such as relationship stability are the key factors and for males the discriminating variables reflect the subcult nature of habitual offenders; poor education, lack of work stability, drug abuse and gang affiliation. The second part of the study examined the effectiveness of the Probation Officers to predict whether the subjects would reoffend. The combination of the Questionnaire and the Probation Officers judgement proved to be the most powerful method of predicting reoffending.

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Contents:

1 Introduction.

The field of predicting human behaviour has been the topic of much interest, debate and criticism over the past few decades. Within this field, the specific area of predicting reoffending is no exception. It has, for economic, political and social reasons (some of which will be discussed in this study), been an area in which research has gathered momentum over recent years (Monahan, 1981; Eskridge, 1983).

Traditionally decisions regarding the likelihood that an offender will reoffend have been made by parole boards, when a prisoners' sentence comes before the board for a review. These parole boards have then had access to two main methods on which to base their decision, a clinical subjective model or a statistically derived predictive instrument (Hassin, 1986). The clinical model, based on the judegement of professionals, has in recent years come under attack (Wormith & Goldstone, 1984; Webster, Dickens & Addario, 1985; Monahan, 1981). Hassin (1981) states that the main critisicm of the clinical approach is that it is based on 'medical and therapeutic-rehabilative needs'. It is an approach which emphasises the individual as an entity, and believes that by examining the individual from a rehabilative stance it is possible to make a prediction centered around the individual.

A statistically derived predictive instrument centers around

probabilities that a person will reoffend, based on information obtained. This information generally relates to the offenders past social and demographic history, and uses specific predetermined variables that have statistically been shown to be significant variables in reoffending (Gendreau, Madden & Leipciger, 1979; Gendreau & Leipciger, 1978; Heller & Erlich, 1984; Mandelzys, 1979).

This paper is designed in two parts. The first statistically examines the effectiveness of a Social History Questionnaire (Riley, 1986), as an instrument for predicting reoffenders. Unlike similar predictive instruments it is administered during the Probation Officers' interview with the offender, i.e. before the offender has been sentenced. The population it assesses consists therefore of a wide range of offenders with differing sentences. The second part of the research compares the effectivenesss of the Questionnaire against the professional judgement of the Probation Officers'.

The variables incorporated into the Questionnaire are similar to the varaibles used mainly in North America, concentrating on the offenders social history and demographic factors (Gendreau et al. 1979; Gendreau & Leiciger, 1978). It could not be assumed that variables that are predictors of reoffending in North America are equally predictive in the microclimate of New Zealand. The results of this study demonstrated the need for a combined approach of the

statistically based Questionnaire and the subjective judegment of the Probation Officer. The variable that are significant in overseas studied tended to have the same predictive power in New Zealand.

2. Variables Examined in Prediction Studies.

In 1935, Lanne advocated the use of specific analytical techniques for judging in advance, the likelihood of a person reoffending. Although he was not the first to suggest this, it was the first time that a sufficient data base on which to establish a scientific basis for prediction, was established. In collecting and summarising the results of eight studies, which examined twelve different offender populations, Lanne pioneered the moving of the field of prediction from an art to a science.

> "... the data described in the studies enumerated yield am ample basis for an attempt to distinguish between those elements which are of universal application in prediction and those elements which are purely fortuitous... In a sense parole prediction has been a fine art the information seems now to be available to place it upon a sound scientific footing... ..[sic]" p 379.

If analytical parole predictions, that is instruments that aim to provide parole boards with an estimate of the probability or risk that the parolee will reoffend, are to be accepted as a science they must adhere to strict mathematical principles. By this he means for a variable to be selected as a predictor variable must first demonstrate a number of characteristics;

i) Orthogonality - freedom from inter-correlation with other factors.

ii) Reliability - it must be continually shown to predict reoffending accurately.

iii) Significance of association - that its predictive powers are higher than a predetermined level of significance.

iv) Stability - its predictiveness remains constant over time and subjects.

Lanne studied 33 factors that looked at, the offender's family and home environment, criminal history, personality variables and employment statistics, derived from data collected on 234 variables. It was over 40 years later that any attempt was again made to systematically tabulate the results of independent studies. Pritchard (1979), like Lanne, aimed to establish a common element or group of variables that were stable in that they were continually and reliablily shown to predict reoffending.

Table 1.

Frequency Counts For Selected Variables (n=177)

Item	Related	Unrelated
Type of current offences	118	27
Presence/number or prior adult convictions	99	17
Stability of employment	96	7
Age at first arrest	77	18
Martial status	75	59
Living arrangment	67	12
Race	65	59
Presence/number of prior adult incarcerations	45	13
Presence/number of dependents	43	48
Employment status	40	20
Presence/nos of associates	22	44
Presence/nos prior arrests	19	2
Type of job	13	6
Educational achievements	12	14
Weekly or annual income	11	4
Presence/nos prior probation orders	11	5
Intelligence rating/score	10	10
History of opaite use	9	1
History of alcohol abuse	9	2
Type of prior offences	6	3
Stability of residence	5	5
Family criminal record	4	4

Pritchard examined 71 studies that reported results from 177 independent samples predicting reoffending. He classified each variable by whether or not, in a given study, it was cited as predicting reoffending. The final result was a tabulation of frequency counts, see Table One for the tabulated results of selected variables. The variables that were seen most frequently to relate to reoffending were also deemed to be the most stable and reliable predictor variables.

One must take care not to place to much emphasis on these

variables. Pritchard in working out the frequency with which a predictor variable was associated with reoffending did not take into account the fashionability of the variable. Fashionability being controlled by the availability of data on the variables as well as the popularity of the variable. By chance alone a variable that is included in nearly all the studies examined, would appear to be a better predictor, than a variable that was a more accurate predictor but that only appeared in a few studies. Categorising the tabulated studies Pritchard found the following variables formed a common group in reoffending predictions.

- an offence of auto theft
- the presence of a prior conviction
- stability of employment
- the age at first arrest
- living arrangement
- current income
- a history of opiate and alcohol abuse.

The majority of these variables have also been cited in current studies (Heller & Erlich, 1984; Buikhuisen & Hoestra, 1974) as relating to reoffending, though the order of significance or the weightings assigned to the variable may differ across studies. These variables have been incorporated into widely used predictive devices such as, the Greenwood Scale (1982) and the Salient Factor Score (1970) used by the United States Parole Commission.

Despite the comprehensiveness of Pritchard's work it is disappointing to note the low rate of inclusion of variables relating to the offenders' social background. This could partially be explained by a lack of studies he found that utilised family background data or he may in fact of chosen not to incorporate this data into his checklist of variables. There is a growing body of research that emphasises the importance of the offender's home environment and family stability (Gendreau et al. 1979; West, 1963; Cunningham, Gosden & Hagger, 1983) in the likelihood of a person reoffending.

What follows is an account of the variables that are prominent in the literature of reoffending. They are in no particular order of significance or strength of association with reoffending. Most are subject to some degree of debate as to there predictive ability and some have been shown over time to be of no predictive value at all. They are however variables commonly found in the study of predicting reoffending.

2:1 Criminal History and the Number of Prior Criminal Contacts.

Even amongst first time prison inmates over half have had at least one conviction either as an adult or a juvenile, and only 24.5% have never had any prior contact with the legal process (Gendreau et al. 1979). One of the most stable and accurate predictors of future criminal behaviour is that of previous criminal behaviour, in that, a past history of offending

The effectiveness of previous criminal records to predict future criminal behaviour is increased if used in conjunction with age (Williams, 1980). In a study on 537 parolees released into the community between April 1 and June 30 1983, Coldren (1985) found that 66% of the sample with eleven or more prior arrests were arrested again in the eighteen-to-twenty months follow up period compared with 47% with six-to-ten prior arrests and 38% with one-to-five prior arrests.

Buikhuisen & Hoekstra (1974), examined twenty-two variables that supposedly predicted reoffending. Using a five year follow up period they found that only ten of the variables differentiated significantly between reoffenders and non-reoffenders. Futher analysis revealed that only two of the ten variables really contributed to reoffending prediction in any significant manner. Of these two variables, one was the number of previous convictions that an offender had.

The presence of prior convictions and imparticular crimes against property, such as auto theft and burglary were viewed by Pritchard as one of the few stable predictors of reoffending. Comparing the types of offences committed by once-only prisoners and prisoners that reoffended in a follow up period Koller & Gosden (1980) found that 98% of reoffenders had been involved in crimes against property as opposed to 38% of non-reoffenders. It is crimes against property, as opposed to crimes against the person that have been proved to be more predictive of

reoffending, and that have led to the development of the punitive strategy of selective incarceration. A policy that is becoming fashionable in the United States.

2:2 Age at First Offence.

One factor that has consistently been shown to relate significantly to reoffending is the age at which an individual first begins to offend (Gendreau et al. 1979; Gorta & Cooney, 1983; Pritchard, 1979; Koler & Gosden, 1980).

Pritchard (1979) reports that an arrest before the age of twenty one is consistently related to reoffending, where as, an first arrest after the age of twenty one years is consistently related to non-reoffending. Mandelzys (1979) puts it more simply; that the older the inmate when he commits his first offence, the lower the probability of reoffending. Adding social history variables into a step-wise multiple regression equation, Gendreau et al. (1979) found that the variable 'to court before the age of sixteen' was highly significant in predicting reoffending $F(10,344) = 14.53$, $p < .01$). Although the age at which a person begins his contact with the law is a good indicator of his level of future offending, Shannon (1985) is persistent in emphasising that whilst most reoffenders have a history of juvenile delinquency, not all juvenile offenders necessarily graduate to become offenders as adults.

Studying the offending patterns of three longitudinal birth cohorts in America (1942, 1949, 1955) Shannon found very similar trends in reoffending behaviour. He concluded that in all three cohorts, although juvenile offenders with two or more offences had a disproportionate share of adult offences, they were responsible for less than a third of all adult offences for their cohort. There is no doubt that juvenile offenders are in a high risk group for becoming adult reoffenders but it is not possible to state which juvenile offenders will become adult reoffenders.

Shannon (1985) is in agreement with Monahan (1981) that it is the number of false positives that should be examined when predicting offending. With respect to juvenile offending as a predictor for adult reoffending he states that the research contains too many false positives to make any judgements about a young persons future offending behaviour. This is a criticism that is relevant for most variables examined in prediction studies. In support he cites the results of the 1942 birth cohort where sixteen of the 270 males which had contact with the authorities as juveniles for an offence but were not actually convicted, as adults produced more offences than those who had committed actual offences as juveniles.

In conclusion, the evidence for a relationship between juvenile offending and adult reoffending is, given that an adult offender has a history of offending as a juvenile, he/she is more likely to reoffend as an adult, than an adult offender who has no

juvenile offending history (Gendreau et al. 1979).

2:3 Age at Release from an Institution.

West (1963) suggests that the average criminal career has a natural, active span of seven years after which a person's criminal behaviour tends to diminish or cease altogether. The occurance of a limited time span is in accordance with a phenomenon known as 'burnout' where, as an offender gets older, they systematically reduce the level of their criminal activities.

Hoffman & Beck (1984) studied the effect of 'burnout' by examining the impact that the age of release from a prison, had on the probability of reoffending. Using the Salient Factor Score (S.F.S.), a predictive device employed by the U.S Parole Commission, they were able to control for other known predictors of reoffending. They noted a significant relationship between the age of release and a favorable post- release outcome. The knowledge that an offender is released from prison at age forty-one showed a favourable out-come rate approximately eight percentage points higher than expected from knowledge from the S.F.S. Taking prior criminal history only into account the association between age of release and a positive outcome was even stronger. They concluded that the knowledge of the age that an offender is when they are released from prison adds additional predictive power to the S.F.S. This is of course, assuming that reoffending reduces with age and not that the offender simply

gets more skilled at avoiding detection as he/she gets older. What has not been controlled for is the biases and expectations by the police that crimes are committed by the younger generation (Hollinger, 1984).

Whilst the majority of predictive studies include age as a predictor of reoffending (Gendreau et al. 1979; Monahan, 1981; Pritchard, 1979), using a discriminant analysis programme, Gorta & Cooney (1983) found age to be unrelated to parole outcome. However this study, involving 250 parolees and three outcome groups; successful completion of parole, breach of parole and failure where parole is revoked, does appear to be the exception. Criminal history was found to be related to outcome to the extent that the magnitude of the criminal background directly related to the probability of parole being revoked. Age in a sense is a function of criminal history and was more than likely acting as a surpressed variable in the discriminant function equation in Gorta & Cooney (1983) study.

2:4 Offense Severity.

A thorough study by Nathan Mandelzys (1979) examined the relationship between the types of offences committed and reoffending.

Mandelzys divided a sample population of 475 offenders from a

maximum security prison psychiatric hospital into five groups (minor, medium, major, sexual offences and murders) based on their most recent offence(s). He found that the five subgroups differed in respect to reoffending on a number of variables. The predictor variable for an offender who committed a minor crime was not necessarily a predictor variable for one of the other groups. For example, with minor offenders, as the sentence and length of time actually served increased so did the probability of reoffending. The reverse situation occured with major offenders and for murderers. For the medium and sexual offenders the probability of reoffending was related only to the sentence length given and not to the actual time served in prison.

It does not follow that the greater the severity of the offence the more likely the individual will reoffend. In fact as Mandelzys (1979) showed, the relationship is often inversly related. The use of long term prison sentences is as much to protect society, and to provide a measure of the abhorance felt by that society to the crime committed as they are to decrease the probability of reoffending.

Mandelzys comments must, in reality, be confined to the extremely atypical population of psychiatric reoffenders, that he studied. The variables that are predictive of reoffending in prison psychiatric hospitals are not necessarily the same as for the standard prisons. However, Pritchard (1979) shed some light on this when he commented that offence severity is not predictive

of reoffending. In fact the offences most commonly associated with habitual reoffenders are crimes against property as opposed to crimes against persons. Offence type would appear to be a better predictor than offence severity.

2:5 Prior Violent Criminal Behaviour.

That prior violent criminal behaviour is indicative of future violent offending, is one of the greatest myths surrounding criminal research (Monahan, 1981). In reality, the effectiveness of prior violent criminal behaviour as a predictor of future violent criminal behaviour is somewhat dismal (Vasil, 1987; Holland, Holt & Beckett, 1982).

Holland et al. (1982) studied this area extensively. They compared the frequency of prior violent and non-violent convictions among 198 adult males, with their behaviour on probation. Using a chi square analysis they found the association between prior violence and performance on probation to be non significant. They noted prior non-violent criminal behaviour is equally likely to lead to violent as to non-violent reoffences. However due to the low base rate for violent offending, a person with a substantial non-violent criminal history is nearly four times more likely to be associated with a non-violent than violent offence on parole. They go on to state that the results of the study provides little support for the routine predictive

use of information concerning prior violent behaviour. This raises serious issues given that clinicians consistantly use the evidence of past violent behaviour as the main indicator of violent behaviour in the future (Monahan, 1981).

The persistent categorising of offenders by the severity of the crime they commit is partialy responsible for setting up prejudices and expectations about future criminal behaviour. Holland (1982), notes that the low base rate for violent reoffending is probably a reflection of 'transitory psychological states' that he considers are important in initiating violent offences. These psychological states may be situational and or chemically induced and are not activated in non-violent offences.

Even if it is the environment and not the individual that precipitates violent offending, personality variables play an indirect part in reoffending, by predisposing an individual to being in situations where there is an increased likelihood of violence. However, as Holland et al. (1982) point out, the violent offence is still a response to situational / environmental cues. Monahan (1981) in his book, Predicting Violent Behavior, dedicates a whole chapter to the role of the environment in predicting violent behaviour. He insists that if clinicians fail to use statistical data to improve their predictive judgement then they must look at the offenders environment or situational predictors to add strength to their judgement.

In a symposium on the management and treatment of violent offenders Devonshire (1988) warned of the dangers of trying to find simplistic explanations for violent offending when defining and treating violent offending.

The Megargee Typology (1977) is used to classify inmates by the types of crimes that they commit. Using this device Moss, Johnson & Hosford (1984) found that categorising inmates into violent typologies did not help predict those who would reoffend, nor did it differentiate between those who were rearrested or reconvicted for violent versus non-violent crimes.

It is still the laymans belief that if a person commits a violent crime they will reoffend again and that the offence will be of a violent nature. The research indicates that the occurance of a violent crime is no indication that the person will reoffend or that, if they do it will be of a violent nature. Predictions of violent reoffending are generally accurate one in three times (Monahan, 1981; Webster et al. 1985), draw the readers attention to the problems of low base rates, high false positive predictions and poor agreement on operational definitions of violent offending.

2:6 Cognitive Discrepancies.

Mental health professionals who try to explain behavioural

patterns as physically based, look towards psychometric tests for the explanation of deviant behaviours in the hope that discrepancies in psychometric tests will provide clues for certain behaviours.

Of these the most common psychometric test used is the Wechsler Intelligence Scales (Wechsler, 1974). It is widely believed that cognitive differences, as interpreted from the WAIS (Wechsler Adult Intelligence Scale, 1958) and WISC-R (Wechsler Inteligence Scale for Children-Revised, 1974) can differentiate reoffenders from non-reoffenders, (Haynes & Bensch, 1983; Lindgren, Harper, Richman & Stehbens, 1986; Mandelzys, 1979; Ganzer & Sanson, 1973). More specifically, there is reported to be a discrepancy between the Performance and Verbal scores on the WISC-R, with the performance scores significantly higher than the verbal score (Haynes & Bensch, 1983; Lindgreen et al. 1986; Andrews, 1974). Indeed Wechsler (1958) commented on this discrepancy, stating that the most characteristic pattern of global intellectual functioning for adolescent delinquents is a higher performance than verbal IQ, but was unable to explain this connection.

Haynes & Bensch (1983) undertook a study of 78 white females, aged fourteen years, who had appeared at least once in the juvenile courts and whose offences were mainly home/school truancy, larceny and shoplifting. All these youngsters completed the WISC-R as part of the psychological examination they underwent when becoming involved with the courts. All the girls

were now past their seventieth birthday and no longer eligible for the young person's court. They divided the girls into two groups, non-reoffenders and reoffenders, based on their record while under the young persons court. The reoffending group displayed the Performance / Verbal discrepancy significantly more frequently than the non-reoffending group, (83% compared with 58% $^2 = 5.60$, $p < 0.019$).

The reoffending group in Hayne's study also demonstrated a significantly higher mean performance score than the non-reoffending group ($m = 95.6$, $m = 90.0$, respectively, $t(76) = 1.65$, $\underline{p} < 0.10$). The verbal score for both groups were lower and the difference statistically non-significant.

It has been suggested by Lindgreen et al. (1986), that the delinquent adolesents with discrepancies in their intellectual abilities are less likely to accurately interpret or understand their environment. He concluded that this combined with an "imbalance in personality organisation", would result in the person having difficulty in maintaining "emotional stability", exercising "impulse control" and reacting inappropriately to environmental stresses. A hypothesis in line with Monahans' concern with the role that the environment plays in prompting offending.

Spellacy & Brown (1984) administered a battery of tests to 100 adolescent boys (mean age of fifteen years) at the begining

and end of a period at a short term residential institustion for young offenders. The battery of tests included: Embedded Figures (Benton & Spreen, 1969); Sentence Repetition, Word Fluency (Spreen & Benton, 1977); Porteus Mazes (Porteus, 1963); California Test of Personality (Thorpe, Clark, Tiegs, 1953); Rosenzweig Picture Frustration Test (Rosenzweig, 1964); Semantic Differential (Snider & Osgood, 1969); WISC-R (Weschler, 1974); Hand Test (Wagner, 1969); Wide Range Achievement Test (Jastak & Jastak, 1965); and the CAPHER Fitness Performance Tests (Canadian Department of National Health, 1966). These tests were repeated with the young offenders again after a period of one-to-two years release from the institution.

They found that the best predictors of post institutional prosocial behaviour (no reoffending) were the; Wide Range Achievement Test (spelling subtest), Word Fluency, Semantic Differential (self-concept), and the Social Standards and Antisocial Tendencies subtest of the California Test Of Personality (CPT) that were given on admission. Changes in the scores on WRAT (reading and spelling), embedded figures, Porteus Mazes (Q-score), Hand Test (acting out ratio), Self concept, Social Skills and Community Relations subtest of the CTP, during the period from admission to release from the institution were predictive of no reoffending after release. They also noted that although a low I.Q. was characteristic of chronic offenders, it did not discriminate between subjects who did or did not show an improvement in post release behaviour. Despite the fact that screening teenagers for discrepencies in cognitive, personality

or neurophysiological functioning will not effectively detect delinquents, Lindgreen et al. (1986), found support for incorporating personality (neuroticism-psychoticism) and intellectual (P.I.Q. > V.I.Q.) variables into predictive devices of adolescent delinquent behaviour.

Interested to see if the P.I.Q. > V.I.Q. sign is prevelent in adults reoffender as well as juvenile reoffenders, Andrew (1974) studied 112 probationers who were refered to a psychological evaluation centre, during January to March 1973, for evaluation with respect to their continued offending. The subjects who's ages ranged from ten years ten months to 37 years (44% under sixteen years, nine percent were 25 years or older; 66% males, 34% females) all completed either the WAIS or WISC on admission. Offences ranged from smoking at school to murder. Andrew found that the P.I.Q. > V.I.Q. sign for the total sample of subjects ($m = 6.76$, SD^2 13.57, $t = 5.24$, $df = 111$, $p < 0.001$), compared with the general population mean difference of zero.

Included in the study was the Interpersonal Maturity System (Warren, 1971). It was interesting to note that the subjects that showed the most marked P.I.Q. > V.I.Q. sign scored the lowest on the maturity scale.

How much an I.Q. test is measuring an intellectual disability, or is indicative of the ability of the education system to met the needs of the individual is unknown. Comparing

the educational achievements of individuals who have been imprisoned once with recurrent offenders, Gendreau et al. (1979) noted that low grade levels, along with indications of behavioural problems at school, were highly related to reoffending.

A connection between schooling and occupational status is a theme that is recurrent amongst research in reoffending. Cunningham, Gosden & Hagger (1983) found that the main characteristics of reoffenders were that they had lower I.Q.'s, less schooling and were in unskilled occupations. At the same time, once only offender's, on average, tend to have a higher I.Q., longer schooling and more skilled occupations. Koller & Gosden (1980) found that eight percent of first time prisoners, compared with 33% of reoffenders attained three years of secondary school. In addition of the reoffenders 93% were unemployed and seven percent in semi-skilled or skilled jobs compared with 38% and 62% respectively for once only time offenders.

Early childhood education forms the basis for subsequent attainment of academic qualifications. The absence of a formal education, employment stability and thus an acceptable work record, is likely to lead an individual into unemployment or low paying unskilled work. It is from this strata of society that the majority of reoffenders or unsuccessful habitual criminals are seen to emerge (Koller et al. 1980).

2:7 Relationship stability.

The importance of a stable positive relationship has been generally overlooked in the literature on deviant behavior, even though its role has been known in connection to offending for some time (West, 1963).

Concerned about the rate of reoffending West (1963) looked extensively at what he termed 'interludes of honesty', genuine gaps in the offender's criminal history, usually lasting between three and six years. These breaks from crime were distinctively different phenomenon than the shorter gaps in a reoffenders criminal record, which usually represent periods of successful evasion rather than a remission of criminal activities. West (1963) noted that these genuine offence-free gaps appeared to be connected to some protective relationship with a parent or marriage partner, and when this relationship terminated the offender relapsed into a life of crime.

Describing the typical female offender in the Southern States of America, Wolfe, Cullen & Cullen (1984) found that she was young, black, poorly educated, occupationally unskilled or unemployed, unmarried and often free of dependents. A number of researchers have found a similar pattern in that the majority of reoffenders are unmarried or in fragile defacto relationships.

The importance of a stable relationship was highlighted by

Gorta & Cooney (1983) using discriminant analysis, where marital stability emerged as the main predictor of what made a good parolee. The marital status was also found to be largely dependent upon the marital status of the offender whilst in prison.

Using a discriminant analysis program Hassin (1986) found that of the 31 background variables that he examined eleven were significantly related to reoffending. Included in these discriminanting variables was an unstable married life. This variable was only predictive if the offender was in a married relationship. It was the unstability of the relationship that was important not whether or not the person was married. Cunningham et al. (1980) noted that a common feature among reoffenders was their failure to marry and have children (75% of his sample of reoffenders had not married, and only 21% had children). When they took into account, reoffenders who had come from families that have had Social Welfare contact, thus defined as coming from problem families, they found that the importance of marrage stability and children as predictor variables for reoffending were significantly reduced. The effectiveness of relationship stability as a predictor of reoffending is increased if the offender originates from a stable family.

2:8 Mental Illness.

Those that seek to explain criminal behaviour in terms of a

medical model tend to look for a correlation between mental illness and reoffending. The relationship between offending and in particular violent offending is one that often and unjustly receives much media attention (Monahan, 1981). It is however a relationship more complex than it appears.

A twenty-two year follow-up study on the criminally insane (patients admitted to a hospital that had been judged non-responsible for an act of crime) in France, showed that using the DSM III diagnostic categories, differences exist between the categories in terms of the type of offences committed and the likelihood of reoffending (Yesavage, Benezech, Larrieu-Arguille, Bourgeois, Tanke, Rager & Mills, 1986). For example they found a low admission rate of violent offending in patients admitted with personality disorders; in fact this group committed 75% of the theft offences reported in the overall sample of admission offences. On readmission this group reflected an increased rate of violent crimes to the extent they were responsible for several murders. This can be compared with 64% of the patients who diagnosed as alcoholics were admitted for offences against the person. On readmission 57% of this group had reoffended in a similar offence.

Like the generic criminal population, psychiatric offenders are a heterogenous group where subgrouping or classifying is possible but generally ineffectual for prediction purposes.

The extent of psychosis amongst reoffenders is an area that is also greatly disputed. Heller & Erlich (1984) studied 9,600 violent and non-violent reoffenders who were referred to a court psychiatric clinic. No difference was found in the levels of psychosis between the violent and non-violent reoffenders. However, when West (1963) looked exclusively at offenders who were sentenced to preventative detention he claimed that if these prisoners were free, half of the subjects demonstrated enough symptoms to be admitted to a psychiatric outpatient clinic, and of these two thirds would need to be hospitalised. It must be remembered that preventative detention in the United States is only given to chronic reoffenders whose crimes are such that they represent an extreme danger to the public; the extent of mental illness may not be so prominant in less serious criminal groups. In New Zealand preventative detention is usually reserved for habitual sexual offenders, where little study on their reoffending behaviour or mental health has been undertaken.

Monahan (1981) in his conclusion on the relationship between mental illness and reoffending comments that, in the absence of violent behaviour, mental illness is not predictive of reoffending. There is at present insuffucient evidence to support relationship between mental illness and violent reoffending.

2:9 Drug and Alcohol Abuse.

Unlike the research into the connection between mental

illness and reoffending, the literature is much clearer concerning the ability of alcohol and drug abuse to predict reoffending (Pritchard, 1979; Gorta & Cooney 1983; Gendreau et al. 1979; Koller & Gosden 1980; Bonham, Yaneksela & Borda, 1984).

Using a multiple regression technique, Gendreau et al. (1979) found that the dependent variable "any current drug offence" was significantly related to reoffending ($F(10,344) = 8.27$, $p < 0.01$). This variable along with nine other social history variables accounted for twenty percent of the variance associated with reoffending. It had a classification rate of 77%, for subjects classified by the equation in to low and high risk groups for reoffending.

The Salient Factor Score (U.S.Parole Commission, 1977) contains six items that produces a score from zero to ten points, the higher the score the lower the likelihood of reoffending. The S.F.S. has been shown to retain its predictive powers over time (Hoffman, 1980). The last item on the list concerns the offenders' history of heroin or opiate dependence in that an absence of such adds one point to their score thus placing them in a lower risk group for reoffending.

It is well recognised that reoffender's are a heterogenous group of individuals. This suggests that differences in drug use may be found amongst the group of reoffenders as a whole. However Heller & Erlich (1984) found the incidence of marijuana, LSD,

amphetamines, barbiturates and glue abuse was equally distributed amongst the different groups of reoffenders.

Chaiken & Chaiken (1984) examined in some depth, the relationship between drug users and the types of crimes committed. Although their work was not directly related to reoffending the results are quite interesting and worth noting. Unlike Heller & Erlich (1984) they found that different drugs were more commonly associated with some crimes than others. Multiple use of barbiturates and intermittent recreational use of heroin appeared to be associated with assault offences while the heavy use of non-opiate psychotrophic drugs was strongly related to high rates for all crimes except non-violent auto theft. With regards to the experimentation with marijuana and some "hard" drugs in early years Chaiken & Chaiken (1984) found no evidence that they were connected to high crime rates.

Like other forms of drug abuse, a high level of alcohol dependence is found amongst reoffenders, (Monahan, 1981; Williams, 1980). Comparing reoffenders with individuals who had only offended once, Koller & Gosden (1984) noted that half the subjects in the reoffending group showed evidence of alcohol abuse, compared with ten percent of the once-only offenders. In a similar study, Gendreau et al. (1979) examined the impact of the age at a person begins to drink alcohol and reoffending. They found that 36.3% of the total sample began drinking under the age of fourteen; of these offenders 66% were reconvicted and 55% reimprisoned. This compares with 48.9% of the sample which began

drinking between the ages fifteen to seventeen years of which 40.2% were reconvicted and 27.3% were reimprisoned.

Gendreau et al. (1979) is in accordance with Koller & Gosden (1984) that it is not the presence of alcohol or drug abuse at the time of the offence that is related to reoffending but the age at which a person becomes a substance user. Crimes that are by there very nature indicative of alcohol abuse, such as drinking driving, shed some light on how effective imprisonment is on the reduction of alcohol abuse. Voas (1987) concluded that there was little evidence to show that imprisonment reduced the reoccurance of drinking driving or the number of accidents.

3. New Zealand Studies on Reoffending.

With the exception of Government Committee Research reports and a study by Mary Schumacher (1974), relatively little time or money has been spent on measuring, or assessing reoffending exclusively within the New Zealand criminal population. Although Government officials and social researchers have always been concerned with the rising crime statistics, highlighted in the 1987 census of prison inmates (Braybrook & O'Neil, 1987), it is only within the last ten years that any systematic attempt to study reoffending has been made.

A recent New Zealand Government publication, The Prediction of Violent Recidivism (Vasil, 1987), provides a thorough review of the moral, ethical, political and methodological issues that arise when attempting to predict violent reoffending. Vasil, like Monahan (1981) debates the clinical versus statistical dichotomy, examining the major clinical studies of the 1960's as well as more recent statistical predictions.

In a study designed to investigate reoffending rates within New Zealand, Oxley (1979) examined 500 randomly selected persons, (405 males and 95 females) sentenced to probation. She found that within 30 months of the original study offence 59% were reconvicted. Reoffending being measured as any offence committed by a probationer that was reported in the Police Gazette. This excluded offences classified as minor offences and traffic offences, thereby deflating the actual reoffending rate. In light of the extended follow up period, two and a half years as opposed to the standard two year follow up recommended in North America (Gendreau et al. 1979; Gendreau & Leipciger, 1978; Hoffman & Beck, 1984; Hokosko & Caldron, 1985) a 59% reoffending rate is not unexpected. Caldron (1984) report a reoffending rate of 48% during an eighteen to twenty month follow up period.

In a statistically advanced study, Schumacher (1974) compared the results from three prediction methods; discriminant function analysis, point score analysis and automatic interaction detector, using a sample that consisted of 347 inmates. Data were

collected on seven of variables that examined the type of offence committed, the presence of alcohol at the time of the offence, age, nationality, marital status and previous convictions. She concluded that regardless of the statistical approach employed there would still be extraneous variables that would significantly effect whether or not the subjects reoffended.

Of all the variables examined, Oxley found that only seven; prior criminal history, the current age of the offender, sex, occupational, marital status, educational attainment and employment, emerged as statistically significant predictors capable of distinguishing reoffenders from non-reoffenders. These findings are in accord with similar overseas studies, (Buikhuisen & Hoekstra, 1979; Gendreau et al. 1979; Monahan, 1981) with the notable exception of race. Oxley found that race (Maori/Non Maori) for males and females did not appear to be a discriminating factor in reoffending, nor in the seriousness of the offence (Oxley, p 24). Overseas studies have tended to notice that there exists a race factor that is significant in predicting reoffending (Hoffman & Beck, 1985).

A comprehensive study conducted by the Young Offenders Unit, Department of Social Welfare,(formerly the Research Unit to the Joint Committee on Young Offenders), validates Oxleys' findings. The committee, over the course of several years published a series of reports on juvenile offending and maladjustment, (Fergusson, Donnell, Slater & Fifield, 1975; Fergusson, Fifield, Slater & Donnell, 1976; Donnell & Lovell,

1982). Data were collected on all the boys within the 1957 cohort (n = 25,000), who at the age of ten were assessed on the Bristol Social Adjustment Guide (B.S.A.G).

The B.S.A.G measures variables pertaining to the boys background, school performance and health. Criminal history up to and including the age of sixteen were obtained from the Children and Young Persons Court for all subjects. Examining this data for the racial differances Donnell & Lovell (1982) concluded that,

> "....while Maoris have a greater probability of an initial court appearances at each age, once one court appearance has been made the prognosis for Maoris and Non-Maoris is much the same." (p 29).

While more Maoris than Non-Maoris commit a first offence, one in two come to official notice before the age of sixteen as opposed to one in six for Non-Maoris (Fergusson et al. 1975), having been convicted for an offence, race is no longer a discriminating factor in reoffending. This is illustrated in the 1987 prison census, where on the twelfth of November 1987, 49% of all prisoners were Maori compared with 44% Caucasion, an alarmingly high proportion of Maoris considering the percentage of Maoris in the total population, (approximately one sixth according to the New Zealand population census taken in 1986). When the census was broken down by age, if a person was under the age of 30 they were more likely to be Maori, however over the age

of 30, a prisoner was more likely to be Caucasion. With the impact of different birth rates for Maori and Non Maori's taken into consideration the significant effect of the statistics is reduced.

It is discouraging to note that compared to a similar study conducted in Philidelphia (Wolfgang & Sellin, 1976; cited in Donnell & Lovell, 1982) the racial discrepancies, for first offenders between Maoris and Non-Maoris is even more marked than the differences between Whites and Blacks in America taking base rates into consideration. An earlier report, "Socio-economic Status, Race and Reoffending", (Fifield & Donnell, 1980), suggested that the disproportionately high level of offending, among Maori children is a reflection of their disadvantaged socio-economic position within New Zealand. The authors went on to predict that only an improvement in Maori socio-economic position large enough to advance the relative position of Maoris compared to Non-Maoris will reduce the comparatively high level of Maori crime.

Understanding the importance of identifying first offenders so that they can be diverted away from the court system Fergusson et al. (1975, 1976), assessed the ability of the B.S.A.G to predict juvenile offending. They concluded that it was only capable of low-to-moderate predictions, accounting for ten percent of the variance for reoffending at the most. Aggression and restlessness in juveniles were the factors that appeared to have the highest correlation with later offending. Scott (1975)

found the B.S.A.G to have a high degree of predictive power when predicting juvenile offending, however his sample differed in that he used boys aged eight to fifteen years, not a standard ten years as in Fergussons' study, and involved a shorter follow up period. Scott's analysis was a cross sectional comparison with known delinquents and non-delinquents as opposed to a longitudinal analysis used by Fergusson with a normal population, where extraneous factors could not be controlled for.

A Y.M.C.A survey in Hastings (authors unknown) in the early 1980,s attempted to seek the opinions of unemployed male school leavers as to why they thought that their friends committed offences. The three main explanations the majority of the boys answered yes too, in desending order are;

a) They want too prove to their mates that they are tough.
b) They see themselves as failures and are just repeating the reputation they have got.
c) They want their parents to give them attention.

It is only by gathering information directly from the population at risk of becoming potential offenders can we begin to understand what factors led a young individual to crime and then what factors are operating to keep that person in a life style of criminal activity. In New Zealand researchers need to address the specific issues facing the young unemployed and inspecifically the young unemployed Maori who represents the

highest risk group for initial offending.

The study of reoffending is still in it's infancy in New Zealand. Efforts have tended to be concentrated on juvenile delinquency in an attempt to identify those groups and individuals that are in a high risk bracket for becoming first offenders. It is imperative that research once having identified the high risk group for first offenders concentrates on establishing systems that predict which offenders are likely to develop into habitual offenders.

The introduction of the Wanganui Computer has enabled New Zealand researchers to access to large data base on criminal patterns and behaviour, instead of relying on local records which seldom reflect a uniform method of data collection.

4 CLINICAL PREDICTIONS

Statistical predictive devices have been prevalent since Lanne published his works on Parole Predictions as Science (1935). Despite the research into statistical predictions and progressive improvements in their predictive power, clinical judgement has been and remains the mainstay of predicting the future behaviour of offenders.

The problems and potential biases inherent in clinical

judgement and decision making, surrounding the prediction of deviant and often violent behaviour are clearly spelt out in Webster's Constructing Dangerousness (1982). The following is a summary of some of these problems and although they refer specifically to clinical predictions they are issues that are equally relevent to the development of statistical predictive devices.

1. Clinical predictions are under ordinary circumstances hard to evaluate. When they are accepted, as happens frequently, they then become untestable, in that if the individual is predicted dangerous he may be confined and thus the prediction itself cannot be checked.

2. Some clinical assessments are based on very limited samples of behaviour. A few clinicians seem unaware that in all likelihood a thorough face-to-face examination forms an essential aspect of the assessment process.

3. Those behaviours that can be measured with great accuracy may in fact yield little to no predictive value. Perceived correlations between prediction and outcome may in reality be illusory based on of loosely formulated theories formed without systematic testing. Human memory is selective in that not infrequently recollections only occurs those predictions that were accurately made. In the clinicians case this process, when combined with a bias towards recollecting the negative correct

predictions, results in the senario where someone is predicted to reoffend, released into the community and subsequently reoffends.

4. Offenders may realise the benefit of certain behaviours during an assessment interview, such as polietness, cleanliness, outward signs of remorse and the appearance of some kind of positive change, and behave in a manner such that the clinical assessment may be largely spurious.

5. Clinicians may not necessarily be capable of offering an opinion that is equally valid across cases. Presumably they are more confident in some assessments than in others. Statistical devices aim to reduce the variance across cases and situations that is an integral part of human decision making processes.

6. There are likely to be differences between what factors clinicians think to be important, as they form opinions, and what variables actually effect their views. People have much less 'direct knowledge' of their negative processes than is commonly supposed and one factor may over ride all other factors in the decision process. It is important the clinicians are aware of their own biases and beliefs of what variables contribute to reoffending and how these may effect their decision making process.

7. Some clinicians inadvertantly hold implicit personality theories i.e., people tend to hold preconceived notions of what traits and behaviours go with what other traits and behaviours

and when this information is not there they fill it in. As a consequence in mind some clinicians, by overestimating the personality traits, tend to underestimate the power of external environmental influences.

8. Generally clinicians fail to gather and attend to base rate statistics. In doing so they often perform their functions with little or no feedback and are therefore likely to continue to make the same mistakes each day.

9. There is a tendency to confuse accuracy of judgement with confidence. Just because one may have more information on someone one is not necessarily able to make a more accurate prediction. Many of the tests used by clinicians may be redundant in that they empirically test the same construct.

10. Clinicians vary considerably in their opinions regarding 'dangerousness' and 'treatability'. The lack of consistency reflects not only their diverse training, but also inconsistencies and difficulties experienced in defining these terms.

11. There is a tendency for clinicians to discount sociological explanations of deviant behaviour prefering instead to deal with the individual model of behaviour. Webster (1982) warns that the process of fitting preconceived ideas into preconceived theories can rapidly lead to faulty predictions.

12. Personal attitudes and biases against what the offender has done is liable to effect a clinicians judgement if not dealt with.

13. Professional interests can impede the search for improved predictive capacity, in that it takes courage on the part of the individual clinician to admit that at present, the behaviour of some individuals under assessment is beyond their control and prediction.

This final point is eloquently by Monahan 1981,

> " The principle impediment to progress in the area of prediction is that most of the difficult problems hide behind a screen of professional judgement." p 40.

Clinical judgement in predicting violent or offending behaviour is criticised primarily for it's lack of credibility, in that the predictions themselves are seldom put to any empirical test. The figure most often cited for clinical predictions is one in three predictions are correct (Monahan, 1981) A study by Hassin (1986) compared the results of parole board decisions with a statistical discriminant analysis programme. Hassin found that the parole board had an error rate of 44.9% wheras the error rate for the statistical prediction was 31.7%. The parole board had erred 1.4 times as often as the statistical prediction. Although parole boards are not synonymous

with clinical predictions often the basis for their decisions are arrived at with information from clinical psychologists and the decision derived in a similar manner.

The extent to which clinical judgement can be inaccurate has been emphasised in a number of natural observation studies. In principle, a researcher could conduct an experiment on prediction in such a way that randomly assigned individuals would be confinded or released, thus enable testing of the predictive technique. For obvious ethical and civil liberty reasons such an experiment is highly unlikely: therefore to evaluate the effectiveness of clinical predictions researchers must lie in wait for a natural study to occur.

The most famous of these natural studies is refered to as the Baxstrom & Dixon study (1966, 1971). Here following a sudden court ruling a large number of 'criminally insane' patients were released from their secure psychiatric units to the community at large.

These patients were followed by Baxstrom & Dixon, independently, over a number of years. Reoffending rates of 14.3 and 14.5 were recorded by both researchers over the follow up period. It is not so much that the reoffending rates were extremely low for what was considered to be a highly dangerous group of people, but that the type of reoffending crimes were not the expected violent crimes against people. Even when the effect

of increased age and treatment received while in the secure unit was taken into account it is still very apparent that the majority of the patients were kept in the secure unit when in reality they pocessed little threat to the community.

It has been proposed that the excessive number of incorrect judgement of the clinicans' predictive abilities, compared with statistical predictions, may reflect inadequacies of the research rather than the actual inability of clinicians to make the correct decision (Holland, Holt, Levi & Beckett, 1983).

To explain this claim Holland et al. (1983) cite a study conducted by Kozol, Boueher & Garafalo (1972), where in an attempt to reduce prison numbers, a Massachutes criminal court released 435 violent offenders into the community. Of the 435 released 49 were released against the advice of the health professionals concerned. Holland et al. (1983) quotes the overall rate of correct predictions made by the health professionals in Kozol et al. (1972) study, in terms of who was or was not predicted to reoffend, as 85.5%. He claims this hit rate supports the propense that clinicians per se are quite apt at predicting violent behaviour.

What Holland fails to mention is the very high number of false negatives and positives found in the sample. Monahan (1981) highlights the 65% level of false positives in the group predicted to be dangerous, a fact that neither Kozol et al. (1972) nor Holland et al. (1983) choose to discuss.

Researchers when examining predictive studies, whether they originate from clinical or statistical studies must note the number of incorrect predictions as well as the correct predictions. To detain or even to incorrectly lable a number of people dangerous or liable to reoffend, for the sake of correctly identifying a few is extremely difficult to justify.

Using multiple indices of recidivism, arrest, convictions and imprisonment Holland et al. (1983) compared the results of a statistical predictive package with the evaluations of mental health professional and probation officers. The following results were found.

1. The statistical package consistently out-performed the decision makers for the undifferentiated reoffending criteria of arrest and conviction.

2. When predicting violent reoffending on all three measures the decision makers performed significantly better. Specifically the decision makers performed best when predicting violent criminal conduct that results in imprisonment.

Wormith & Goldstone (1984) studied the impact of incorporating clinical data into a statistical schema. They found using both a multivariate and univariate analysis the addition of the clinical data did little to improve the predictive power of

the statistically based instruments. The same result was found by Genderau et al. (1979) in a similar study, where clinical judgement in the form of fifteen psychometric test scores, including the MMPI, was added to a statistically derived list of social and demographic variables that they had previously found significantly related to reoffending. The addition of the psychometric tests added little accuracy to the prediction score for high and low risk groups and in fact reduced the accuracy of the prediction from 42% to 39% for the medium risk group.

It appears from the literature that clinical judgement when standing on it's own or incorporated into a statistical device, has limited predictive power. According to Holland et al. (1983) the use of clinical predictions may be best focused on the specific violent offender. Any clinical study must carefully examine the number of false positives and negatives in the study as well shrinkage that occurs in cross validation studies, before it can be used across subjects with any degree of confidence.

Given the apparently poor predictive abilities of the general clinican perhaps it would be wise for them to bear in mind that their traditional role is one of helping the individual. This role by it's very nature is at variance with the underlying rational of predicting future behaviour for the protection of society. A role that Monahan (1981), considers is very much governed by the political, economic and ethical considerations of the time.

A more middle of the road approach is taken by Wormith & Goldstone (1984), who state that despite sophisticated statistical approaches to prediction studies the outcomes of these studies have been often less than overwhelming. A combined clinical-statistical approach is advocated by the authors though they admit that such an approach is more complex than a simple summation and incorporation of clinical data into statistical schemas.

The above research has questioned whether a combined approach is in deed the best method by which to increase the power of predictive instruments. Despite the disappointing results to date it is area of research that is receiving greater attention.

5. The Types of Predictive Instruments Available.

Predictive instruments have been used for five major applications. Generally these predictive instruments have been designed around set specifications with the purpose of meeting certain needs. These needs vary from those of an administrative nature, such as instruments designed to aid parole decisions, to instruments which are used primarily to assess the offender's needs and responses to rehabilitation programmes (e.g. does the offender show a drug problem and if so are they likely to be helped by a certain rehabilitation programme?). A predictive instrument may be seen to have a primary application, however it is not uncommon for it to be used to meet more than one goal.

What follows is an account of five different predictive instruments available, each designed specifically to meet the needs of the administrators of the instrument.

(i) Instruments that predict behaviour in and following release from prison.

The Megargee Typology, developed by Megargee in 1977, is an instrument designed to differentiate violent from non-violent inmates for administration and rehabilitation systems. It is an inmate classification procedure based on the Minnesota Multiphasic Inventory and it is a good example of an instrument that aims to predict criminal activity of prisoners while in prison and after their release.

Inmates are classified into one of ten subgroups (given arbitary names). Subgrouping is conducted on the basis of the inmates score on a number of items including the MMPI, demographic information and institutional behaviour as defined by the number of disciplinary reports and measures taken while the individual is in the institution. Each of these subgroups represents a defined typology, for which the Megargee Typology has developed a model characterisation which is designed to illustrate all members of that group.

A critical assessment of the Megargee Typology by Moss, Johnson & Hosford (1984) found that the typology subgroups did not stand up well to a series of chi square analyses that

compared the typologies with a number of predictive measures. In their retrospective study Moss et al. (1984) noted that the typologies could not differentiate violent from non-violent offenders, in that they were unable to distinguish between those offenders sentenced to imprisonment for violent crimes versus non-violent crimes. With respect to the ability of the instrument to predict behaviour whilst in prison, Moss et al. (1984) found no significant difference between the groups for those that were and were not involved in prison riots. The final claim of the Megargee Typology was that it is able to predict reoffending amongst prisoners released from prison. After a ten year follow up period they found that the Megargee Typology did not produce any significant predictive information on reoffenders. There was little differences found between the typology groups reoffending probabilities.

(ii) Predictive Instruments and Parole Decisions.

Challinger (1974) developed a predictive device to aid parole boards in making a decision with regards to a prisoner's suitability for parole. It was Challinger's view that the predictive instrument should not be used exclusively to determine eligibility for parole but was to be used in conjunction with established decision making procedures.

He found that generally, parole boards consist of part-time members that rely heavily on lengthy files and submissions along with experience, common sense and insight. He suggested that as a rule-of-thumb if the predictive instrument was not in agreement

with the parole boards decision, the parole board should reconsider the case rather than automatically reverse its decision on the basis of the predictive instrument.

Used in Victoria, Australia, the instrument consists of a checklist of 25 variables including: the offender's criminal and work record, parole conditions, country of birth, age and marital status. Challinger noted that all these variables had been previously found to be significantly related to reoffending. With each variable representing one point, the assesser, usually the Probation Officer, simply goes down the checklist and ticks the variables that are appropriate to the offender. The ticks are then tallied, with the higher the cummulative score the greater the risk or probability that the prisoner will reoffend. The maximum attainable score of 25 indicates a high probability that the parolee will reoffend. Challinger (1974) noted that the instrument exhibited good predictive validity between the checklist scores and reoffending.

The advantages this system has to offer the parole boards is three fold. First it is easy and quick to administer, second the parole board is provided with an instant profile of the parolee and finally each parole board has available to it the same data set for each potential parolee. The major disadvantage of the predictive instrument is that many of the factors that can reduce a parolee's score, thus increase the likelihood of the inmate achieving parole, are either beyond the control of the parolee,

such as race or attaining the age of twenty one, or are unlikely to occur whilst in prison, such as getting married or finding employment. This in itself has serious implications for the justifiction of current prison institutions as a means of rehabilitation.

(iii) Predictive Instruments and Policy Decisions.

Selective Incapactitation is a process on trial in the United States. It centers around the philosophy that concentrating Criminal Justice resourses on the most active offenders will ultimately reduce the rate of crime and convictions. The basis, and in many ways the success of Selective Incapacitation, depends on the extent of which certain criminals are more active than others. Imprisoning those offenders that commit a high rate of crime will substantially reduce the crime statistics. If this is the case, and the crime rate statistics appears to show that it is, the issue then becomes how to identify those criminals that committ a disproportionate amount of crime.

Williams (1980), examined the combined effect of four predictive studies for the purpose of targetting individuals for the Washington D.C. Selective Incapacitation programme. He choose four predictive instruments that were each aimed at a specific issue and combined them to see if the amalgamated version was effective in identifying offenders for selective imprisonment. The first study examined the estimated impact of a Criminal Career Programs on further criminal offending (Williams, 1979).

The study based on a population of adult arrestees, lacked information on juvenile offending. The second study, conducted by Kessebaum & Keller (1978) provided Williams with a predictive instrument that incoporated data on the offender's juvenile behaviour. Petersilia, Greenwood & Lovin (1980), provided the third study. It had the disadvantage of only including persons already imprisoned, but it included a self-report measure of criminal behaviour that was thought to be advantageous. The final study by Sorin, Toborg & Pone (1979) is based on an analysis of bail decisions and looked at the problem of pretrial reoffending.

Williams (1980) combined the results of these studies to produce a profile of a 'typical' career criminal: This person was described as,

> " A young person in his late teens or early twenties, arrested for robbery or burglary, or a series of property crimes, with a juvenile record and a long criminal history, *with* only a few years on the streets who is unemployed and uses drugs" (p. 93).

It was William's aim that this 'typical' reoffender could be used to aid in the selection process for Selective Incapacitation programmes. Given that the data for the profile has arisen from four separate populations, its' validity must be questioned and the question of shrinkage of predictive power must be addressed.

(iv) Prediction instruments that assess rehabilitation programme suitability.

Bonta & Matiuk (1987) took a different approach to the use of prediction models by implementing an assessment instrument that emphasises the importance of evaluating the offender's needs along with their potential risk of reoffending for the purpose of rehabilitation.

The Level of Supervision Inventory (L.S.I.) was developed in Ontario in the early 1970's and, like the Megargee typology and the Wisconsin system, it utilises an offender classification system. The L.S.I. was designed to identify potential or suitable candidates for correctional halfway houses, which were an alternative to penal institutions. It is based on a combination of direct interview and official records and each item is scored either 0 or 1 depending on the presence or absence. The inventory yields ten subgroups which are based on the offender's demographic and social history and their rehabilitation needs. The higher the score the higher the risk that the offender would reoffend if placed in a half-way house thus the greater the need would be for supervision.

It has been noted that reductions in prisoner's L.S.I. score brought about by treatment, were related to lowered risk of reoffending, substantiating the need to incorporate both the risk of reoffending and the offenders needs, as defined by the L.S.I., in a predictive device. The L.S.I. is reported to predict reoffending with a correlation of r =.43 and for future

imprisonment r = .37. While this correlation is relatively low the L.S.I. was not designed to predict reoffending but to identify potential half-way house candidates and assess an offenders rehabilitation needs.

(v) Predictive instruments that examine specific crimes.

It is axiomatic that the criminal community consists of a wide, diverse and heterogenous population (Mandelzys, 1979). So diverse that some researchers, have atempted to reduce the variance in the data population by looking at predicting reoffending for specific crimes. It was hoped that this approach would result in an increase in the reliability and predictive power of the instruments.

It is equally established that certain crimes, namingly offences against property, are committed at a higher rate than others. This has led to the notion that there is a characteristic or typical person for each class of offences, and that as a general code of practise, offender's limit themselves to certain broad categories of offences, such as sexual offences, crimes against property or crimes against persons (Chaiken & Chaiken, 1984). If this is the case, then different contingencies must apply for the identification and treatment for each group of offenders. A number of predictive instruments have been developed with the specific purpose of identifing certain criminal groups and the probability of reoffending within these groups.

(a) Predicting sexual offending.

With the knowledge that a substantial proportion of sexual offenses are committed by individuals under the age of eighteen Smith & Monastersky (1986) examined 112 male juvenile sexual offenders in order to identify what characteristics in this population were reliabily related to reoffending. Using a Stepwise Discriminant Analysis Program, 36 predictor variables were entered into the equation. These predictor variables included scores on a Juvenile Sexual Offenders Decision Criteria which examines the offender's sexual history, behavioural problems and self and family attitude, as well as a number of other variables that examined the offender and his family. With three criteria groups, non-reoffending, non-sexual reoffending and sexual reoffending seven variables were found to significantly distinguish between the groups (see Table Two).

Table 2: Variables That Significantly Discriminate Sexual Reoffenders.

Unhealthy sexual attitudes
Referal sexual offence was rape
Risk of reoffending was assessed as high
Number of siblings at home
Evidence of depression or negative self-esteem
Willing to explore offence non defensively
Physically or sexually abused themselves.

These variables could then be used to classify sexual offenders in terms of their probability of reoffending and more

specifically, whether or not the offence would be of a sexual nature. Using a jackknifed correct classification procedure using the above variables 59.8% of offenders were correctly classified as to whether or not they were likely to reoffend with a sexual crime.

A similar study in Norway (Grunfelf & Noreik, 1986) found a reoffending rate of 12.8% for sexual reoffending with rapists having the highest tendency to reoffend. They noted that most offenders only reoffended once within the nine to fourteen years follow up and that these offence was either of the same degree of severity or less.

Although sexual offenders tend to have a mixed criminal record, the relationship is not reciprocated, in that nearly all sexual offenders commit other crimes but only a small proportion of all offenders commit sexual offences.

(b) Offences against property.

Burglary is by far the most numerous of serious offences, which in itself raises issues of changing base rates when comparing the success and failure rates of predictive instruments. In a study based on analyses of data about burglary situations, events and persons convicted, Eskridge (1983) devised a prediction model that found a relationship between burglary situations and the individual burglar's characteristics. Given that the Police can identify a burglary situation, Eskridges'

predictive model was designed to provide the Police with a typology of the person that was most likely to have committed that type of burglary. His model aimed to increase both the nature and extent of information available to the Police to aid their investigations. For example if the Police could identify the type of establishment broken into, the day on which the burglary occurred, the value of the goods lost and the type of method used to gain entry, then Eskridges' model could predict the number of people involved in the burglary. The discriminant analysis accounted for 41% of the variance associated with number of offenders involved. This knowledge was then used to provide valuable information on the burglar's characteristics.

(c) A predictive instrument for Drinking and Driving.

Known as the (M-F), test the Mortimer-Filkins test includes a self-administered questionnaire, an interview schedule, a questionnaire and interview summary sheet, a blood alcohol concentration tally sheet, driver and criminal records and a treatment evaluation sheet. The scores for each of these measures place the driver into one of three groups; social drinker, excessive drinker and problem drinker.

In an evaluation of the M-F Test, Wendling & Kolody (1982) found that there was a marginal but non-significant correlation between the driver's cumulative score and reoffending, with the higher the score the higher the rate of reoffending for drunken driving. They determined that in order to predict reoffending using the total score, 19.3% of the non-reoffenders would be

incorrectly classified in order to correctly identify only 29.3% of the reoffenders. With the rate of non-reoffending to reoffending approximately three to one, Wendling et al. (1982) found that the actual numbers of incorrect classifications exceeded the number of correct classifications. Interestingly enough a break down of the M-F items found that the best predictor of drunken driving reoffending was the self report measure of the person's drinking driving history.

6. Philosophical Issues on Predicting Future Behaviour.

The concept of analytically predicting a person's future behaviour raises ethical issues amongst researchers concerned with the role of predictions and the functions of parole boards.

To understand the implications of predicting future criminal behaviour, for the individual concerned and society as a whole, we must first understand the role of prisons and how they are perceived to effect criminal behaviour. In the Economics of Crimes (Andreano & Segfried, 1980) four functions of prisons are cited;

(i) Punishment: Durkheim suggested in the last century that a healthy society is one in which the individuals in that society want to do what is thought to be right. In doing so societies 'moral fibre' is strenghtened by the

knowledge that wrong doers are punished for their acts. Punishment such as imprisonment has been viewed as a form of retribution and vengance. In the eyes of the non-offending public it restores the balance upset by crime.

(ii) Isolation of the guilty: The physical act of imprisonment removes the offender from society thereby protecting society from the offender for a period of time. Isolation from the 'civilised' world is also viewed as a form of punishment.

(iii) Rehabilitation: The emphasis that prisons place on rehabilitation depends very much on the view that society has towards offenders. The term implies that criminals are some how different from non-criminals, and that they need to undergo a form of treatment in order for them to learn to behave like non-criminals. Studies investigating the impact that rehabititation has on offenders has led to what Gendreau & Ross (1987) term the 'nothing works doctrine'. Where continuous negative reporting produces a climate that discourages new methods of rehabilitation and treatment. This doctrine still operates despite evidence to the contrary.

(iv) Deterrance: The deterrant aspect of prisons is a dual function. It can act directly on the individual who has been in prison and found it unpleasant enough not to reoffend, or the concept of prison itself may act to deter

others in society from committing offences. Too often researchers look only at the deterant effect on the offender and not on society as a whole.

Those that espouse a clinical based prediction claim that statistically derived prediction devices suffer from a loss of information on an individual level. Information that is felt to be vital to ensure each case is dealt with on it's merits and in such a way that the offender's personal disposition and response to treatment is measured.

Notwithstanding their arguement, no matter what angle you view predictions, ultimately the prediction of reoffending is only an exercise in decision theory (Wormith & Goldstone, 1984) and that in the past and basically still today, by a large extent, this decision making process has been the perogative of the parole board. Few realise that more often than not these boards are made up of individuals who are selected for being "good morale citizens', and not necessarily good decision makers. Marshall (1981) points out that these board members, who come equipted with their own set of biases and predjudices, experience three main influences when deciding a prisoner's suitability for parole.

(i) Community attitude, towards the offender and the type of offence committed. The function of prison commonly viewed by the community for the type of offence commited is a large

component of the decision making process;

(ii) Board members attitude: the dynamics of the board and prevailing philosophy towards early release. The board's biases and beliefs;

and

(iii) The ability of the board members to identify with the offender. Whether the board members can see the offence as in some way acceptable given the circumstances.

Most board members still tend to hold the ethnocentric view that man is rational and that given the right environment good will prevail over evil. Marshall (1981) points to a growing body of literature that suggests that many career criminals are criminals by choice not out of circumstances or necessity.

Like the decision making process of the Parole boards the field of criminal justice research is value laden. As Bennett (1981) states, since the dropping of the atomic bomb all researchers must assume some responsibility for the short or long term effects of their research. An instrument that is able to determine the probability of a persons likelihood to reoffend has the potential for great abuse. Even if an instrument was able to predict with 100% accuracy, ethical concerns are still raised over the idea of detaining a person on the basis of the future probability of offending.

6:1 Ethics of Statistical Predictions.

a) Use of Official Records.

Improvements in the predictive power of a predictive instrument has arisen from an increasing use of the offenders demograbhic and social history data (Gendreau et al. 1979). This increase in predictive power, based on personal information given by the offender, has been derived at the expense of the offenders privacy and personal rights, Wilkins (1980).

The two main sources used to collect this information are the offical records and self-report instruments. Both of these sources raise issues of the offender rights with respect to consent. Consent is often confered by the participation of the prisoners in prediction studies, where participation itself may be associated directly or indirectly with a system of rewards and coercion. When such instruments are in operation, the question is then raised as to the rights of an offender to not provide the necessary information required for the instrument to operate. The subject of consent to participation in criminal justice research is similar to that over the issues that arise with the national census; the right to provide or not to provide the necessary information is an area that requires clear guidelines set down.

b) Use of Prediction Models.

Rhodes (1985) cites the three most common uses for statistically based prognosis as;

i) to provide a structured format for the selection of defendents for criminal rehabilitation and treatment programs,

ii) to detain and remove from society dangerous defendents prior to trial,

and

iii) to extend or reduce prison terms, by parole decisions, for offenders depending on the perceived likelihood that they will reoffend,

a fourth category relevent in New Zealand concerns sentencing, and is where applicable,

iv) to use preventative detention sentences to those likely to reoffend.

A question of ethics arises over the justification of including variables, which the offender has no control over and for which they can not be responsible for, in the prediction devices that can have such an influence over the offenders immediate or long term future. Such variables include race and age which cannot be controlled by the offender and yet where a predictive instrument is used to select offenders for a treatment plan or to aid in granting parole it may prove to be a highly advantageous or disadvantageous variable. For example a predictive instrument that has found over a number of inmates that the variable 'being a Maori' is highly correlated to reoffending will mean that a Maori person who is being assessed with the instrument is already at a disadvatage for the meer fact that they are a Maori. A variable they cannot change or had any initial control over.

The use of such generalised variables such as age, race and

sex in predictive instruments may provide valuable information on how the average offender behaves but this occurs at the loss of individual information. Despite this downfall in predictive instruments that include these general variables, Challinger (1974) is quick to point out that the statistician is the first to concede that predictive instruments can not do justice to the individual traits that are imperative to an offenders readjustment to society. For this reason predictive instruments should only be used in conjunction with the individual approach used by parole boards.

c) The Question of False Positives.

Any evaluation of the study of predictive instruments must look critically at the question of false positives (where a person who is predicted to reoffend in fact does not do so), and the ethics surrounding the impact that false positives has upon the individual, society and the legal system. The presence of false positives justifiably concerns some of the critics of predictive instruments, to the extent that they believe that statements and decisions that have a predictive basis should be avoided at all costs (Wilkins, 1980) and that punishment ought to centre around past behaviour and not a future probability of reoffending. This however is not feasable as determining a sentence includes at least two components; punishment of the individual for the crime committed and the rights of society to be protected from crime. A prediction of the likelihood that the person will reoffend is an integral part of this second

component.

Hassin (1986) notes that parole boards are caught in a "a psychological dissonance because of the conflict between the probability of future rehabilitation and the probability of preventing future recidivism". In that the board has to weigh up the value of an early release into the community, where the inmate can achieve a successful integration into the wider society, which carries the risk of a false negative prediction, or maintaining the inmate in prison to undergo rehabilitation programs and to protect society. Here the risk is that some inmates will be detained unnecessarily. Clearly such a balance is an inmense task and burden for the boards, a combination of a good statistical predictive instrument plus the board individual approach appears to provide a more accurate and acceptable approach to area of parole.

7 Statistical Studies.

In an intense effort to increase the efficiency of statistical predictions, a number of analysis have been tried and tested (Bonham et al. 1984; Gendeau et al. 1979; Lindgreen et al. 1986). Unfortunately with little to no beneficial effect as minimal differences appear to exist between the predictive power of the relatively complex and sophisticated methods of log regression and discriminant analysis and the early simplistic methods of point allocation and unit weight analysis (Wilkins,

1980). Although multivariate techniques have not markedly improved the effectiveness of reoffending measures (Fergusson et al. 1975; Wormith & Goldstone, 1984; Wilkins, 1986), their absence in favour of univariate analysis is often a source of criticism (Buikhuisen & Hoestra, 1974). By examining the inter-relationships between variables, multivariate analyses tends to be more sensitive to the data than univariate or bivariate analyses (Wormith & Goldstone, 1984).

Traditionally prediction studies fall into one of two categories, linear or configural. Linearity prevails when the author assumes a underlying continuity between the criterion variable "Y" and the predictor variables (Xi-Xn). The debate over the superiority of either strategy was evident as early as the 1950's when Meehl (1959) hypothesised that configural predictions, where a linear relationship between the predictor variable and criterion variable is not assumed, may be superior to linear strategies. This claim was refuted by Gotfredson & Ballard (1963, 1965, cited Pritchard 1979), who using the same data set of adult male probationers as Meehl, found multiple regression to be superior to configural analyses in seperating success from failure on parole. Pritchard (1977) attempted to resolve the debate by comparing three linear analyses with four configural analyses. He found that, in the prediction of reoffending amongst adult male probationers the linear strategies were superior at all levels of analyses.

What follows is a summary of the statistical strategies that have been found to be of value in criminological research. The criterion variable is a function of the definition of reoffending used, as well as the statistical strategy employed and will be defined in each section.

7:1 Linear Strategies.

1: Bayne's Conditional Probability Model.

Lindgreen, Harper, Richman & Stehbens (1986) employed a Bayesian Conditional Probability Model when examining the impact of "mental imbalance" combined with background variables on later adolesent behaviour. Criteria outcomes were defined in two categories: as problem and no problem behaviour.

For each predictor variable, a probability was obtained for each criterion category. To estimate the category in which the individual was predicted to belong, the probabilities were multiplied (predictor variable by category). An 81% accuracy or hit rate was obtained when comparing the predicted outcome at the follow up period (Lindgreen et al. 1986).

Although the Baynes probability model produced a high accuracy level, it is not an appropriate formula when wishing to mathmatically combine several predictor variables. To achieve an optimum score on a criterion variable, or to find the best estimate in which category on individual belongs, multiple regression or discriminant function analysis is more suitable

(Neufeld, 1977).

2 Discriminant Function Analysis.

Discriminant function analysis is a strategy used to examine the predictor variables for differences, as opposed to continuity. It derives discriminant functions that optimally separate the outcome groups (reoffenders and non-reoffenders). It expresses the predictive power of the function through a variety of statistics, including the chi square, bivariate correlation and two-way contingency tables. A jackknife classification table is given in the discriminant analysis function printout. This is a technique that produces pseudo-values which correspond to individual instances or subgroups. In doing so it provides a measure of the internal stability of the discriminant function (Tukey, 1969). An illustrations of this technique follow.

Bonham et al. (1984) viewed parolees as comprising of two mutually exclusive groups, those who reoffend and those who do not. In defining the criterion variable (parole outcome) dichotomously as success or failure, Bonham et al. (1984) subjected thirteen predictor variables to a stepwise discriminant analysis. With the Wilks Lamdba test of significance, nine of the thirteen variables met the criteria for entry into the equation : seriousness of the crime, time served, reoffending risk, institution behaviour, substance abuse, inmate attitude, community attitude, prior criminal record and program utilization. These variables accurately discriminated between

those parolees who reoffended and those who did not. With a two year follow up period, a 37.1% reoffending rate was recorded, a rate in accordance with similar studies.

3 Multiple Regression.

In reality, the typical offender does not fall into one of two discrete categories (reoffender or non-reoffender), but instead rehabilitates in a stepwise fashion (Gendreau et al. 1979; Gendreau & Leipciger, 1978; Oxley, 1979), thus following a path of reoffending that gradually reduces to a relatively law abiding existance (Moberg & Ericson, 1972).

Defining reoffending dichotomously in categories such as success or failure may be doing an injustice to the predictive package and/or rehabilitation program used. Subtle positive changes may have occured that might be overlooked, or classified as a failure in the dichotomous format, for example a reoffending offence may be in the form of a parole breach where the original offence was of a more serious nature. The reduction in offence severity may be the result of a rehabilitation programme and indicative of a move towards a crime-free life style, a change that should not be classified as a failure. The use of all-or-none measures has been a contributing factor to the "nothing works " doctrine of criminology, according to Lipton, Martinson & Wilks, 1975 (cited Gendreau et al. 1976).

Those that apply multiple regression to the prediction of reoffending view parole outcome in terms of degrees of success or

failure. Gendreau et al. (1979) collected data on the social history, family history, family background, work history and prior criminal behaviour of 802 parolees from Guelph Correctional Centre. Using a forward stepwise multiple regression, they derived a prediction of reoffending equation consisting of ten predictor variables. Reoffending rates for the construction and validation samples were obtained. A correlation of .44 between the predictor variables and actual reoffending rates was achieved, this may appear low but as Gendreau et al. (1979) point out because of the large number of variables acting on a reoffender it would be virtually impossible to achieve a higher correlation magnitude.

The problems associated with multiple regression are the same that apply to all linear analyses in that there is often no valid reason for assuming linearity between the predictor variables and the criterion variable or that an additive combination of the predictor variables will produce the optimum prediction model (Fergusson et al. 1975; Keren, 1982). This issue was addressed by Seddon & Moore (1987) when they reached the conclusion that,

> ".....while psychological compound variables do not actually conform to the linear model this effect per se is of no pratical consequences...."(p. 176).

In practical terms linear models are more robust than previously accepted and are quite acceptable for prediction studies. Nontheless, where a bivariate relationship exists

between the criterion variable and the predictior variable, and the combined effect of the independent variable are not additive, it is possible to use a log linear regression models (Nie et al. 1982). However as the assumption of linearity does not pose a major threat to the predictive validity, this seems an unneccessary and complicated procedure.

7:2 Non Linear Models

The four non-linear or configural strategies used by Pritchard (1977), proved to be inferior when compared to linear models. However two of these strategies, (Mean Cost Rating and Predictive Attribute Analysis), have been successfully used by other researchers in the field of prediction and found to be of value.

1: Mean Cost Rating.

Mean cost rating was a term developed by economists for use in cost/utility analysis. It was developed by Duncan, Ohlin, Reiss & Stanton (1953), to aid in the selection decisions that were based on a psychometric test score. In prediction studies, mean cost rating aims to measure the predictive power of the independent variables, where the criterion variable is dichotomous (Fifield & Donnell, 1980). It is a formula designed to measure whether there is a discrepancy between reoffenders and non-reoffenders based on their socio-economic data. It's major advantages over linear strategies are that;

1) it is not influenced by base rate,

2) it is sensitive to the order in which the risk table is set out,
3) it involves no assumption of normality, continuity or equality of score units, (Fifield et al. 1980).

Despite the fact that mean cost rating provides a good measure of predictability, Fergusson et al, (1975) emphasises caution on its use as it's results are often difficult to interpret. This he states is because mean cost rating leads to no obvious degree of prediction, though apparently it can be shown to bear a relationship to the theory of signal detectability.

2: Predictive Attribute Analysis (P.A.A)
Automatic Detection of Interaction Effect (A.I.D)

Both P.A.A and A.I.D are based on the same principle, that a sample of observations is sequentially split into a series of two way partitions, as defined by the predictor variable, so that the within groups variability of the criterion variable "Y" becomes smaller (Fergusson et al. 1975). They aim to find combinations of variables that are found in the majority of reoffender or non-reoffenders and pay special account to the interaction effects of the variables.

The A.I.D analysis results in a predictive tree diagram, that like most prediction instruments tends to have greater predictive power for the sample of observations it was constructed on than for the validation sample. Although both A.I.D and P.A.A have been used in conjunction with prediction

studies, in reality they have not proven as effective as the linear models of prediction (Schumacher, 1974).

8. Predictive Instruments: Statistical and Methodological Issues.

8:1 Criterion measure, Follow up Length and Critical Periods.

The rates of reoffending reported in any study depends on two factors. Firstly, the period allowed for the offender to fail or succeed, known as the follow up period and secondly, the definition of the criteria measure or degree of reoffending required for the subject to be classified as a reoffender. Hoffman & Stone-Meierhoefer (1980) comment that the confusion and lack of agreement over reported reoffending rates arises from the inconsistencies in the criteria and follow up periods. They go on to say that reported rates of reoffending are meaningless unless accompanied by information on the various definitional and methodological choices used in the design.

Follow up periods may vary from one to two years for general predictive studies that aim to test out a predictive instrument (Bonta & Matiuk, 1987; Gendreau et al. 1979) to longitudinal studies e.g. Yesvage et al. (1986) 22 year study on reoffending amongst Frances criminally insane.

According to Caldron (1985) nearly half of the inmates

released from an Illinois prison are rearrested with approximately one-third back within 18-20 months in prison. In an extensive study that looks at the importance of the length of the follow up period Flanagan (1982) found that the critical period for reoffending varies as a function of the risk classification of the offender. The risk classification being defined by the number of predicting variables the offender displays, this varies for each study. Those offenders classified as high risk find that the first year of release is the critical period, in that it is the period in which they are most vunerable and suseptable to reoffending. For those in a medium or low risk group are 'at risk' in the initial second year of release. Flanagan insists that any measure of reoffending must incorporate two components, a measure of the population of cases that will ultimately fail and the pace at which cases fail.

Reoffending rate is, by definition, a negative outcome that occurs within a predetermined time. What makes comparisons of reoffending instruments difficult and often invalid, is that not only may they differ in the time allowed for reoffending to occur but also in the criteria used to measure reoffending. A study that includes all misdemeanors and breaches of parole conditions as reoffending offences will show a higher reoffending or failure rate than a study that defines re-imprisonment as its' only measure of reoffending.

In an effort to standardise criterion definitions of

reoffending some authors have designed index outcomes (Gendreau et al, 1978; Moberg & Ericson, 1972). The reoffending outcome index developed by Moberg & Ericson (1972) aims to measure the disposition of the offender by incorporating a scale that ranges from one to ten. A score of one represents re-imprisonment for a felony which has been admitted, confessed to or proved. At the other extreme a score of ten represents no illegal activity or technical violation recored on official records. The scores on the index can be grouped into wider categories that show a gradual change from failure by reoffending to success by non reoffending.

Score	Interpretation	Category
0-4	Failure	
5-7	Marginal Failure	reoffending
8	Marginal success	
9	Qualified success	non reoffending
10	Success	

The scale by measuring a progression of degrees of seriousness of the reoffence(s) provides a measure of the extent that a parolee has succeeded or failed on parole. Like Moberg & Ericson (1972), Gendreau et al. (1978) express concern of the use of binary classifications of reoffending and advocates a scaled index that measures a persons' reoffence within the context of its' degree of seriousness.

8:2 Methods of Data Collection in Prediction Studies.

1 Self-report data.

Self report methods of collecting data has been extensively

used in prediction studies especially where the information is not available on records such as demographic information e.g. early childhood behaviours. Concerns have been raised over the reliability and validity of such data (Wormith, 1984). Fears are that there may be a tendency to report a reduced number of offences and police contacts or to confuse time spans and the level of seriousness of the offences.

Comparing self report measures of police contacts with official records for each member of a birth cohort, Lab & Allen (1984) found little difference between the measures. Of the individuals who reported no contact, only 7.5% had in fact one or more official police contact, while 7.9% who had no official contact recorded, had at least one contact for a statute offence. Similar results were found with felony offences and misdemeanors. Breaking down these subject's data into demographic categories they concluded that males who were less educated and from low socio-economic status tended to under report contacts for felony offences, while residence of high socio-economic status tended to over report status offences. This is a discrepancy that may be rectified by clear definitions of what consitutes an offence or contact.

In a study that examines four aspects of reoffending; seriousness of the offence, frequency of activity, diversity of activity and progression into delinquent behaviour, Zimmerman & Broder (1980) found that self report measures of reoffending were

highly reliable and consistent.

2 Interview techniques.

Much of the personal information used in current predictive instruments is derived from interview-based assessments, and as such is open to biases and misinterpretation. Andrew, Kiessling, Robinson & Mickus (1986) explored the issue of interview validity by using an interview-based version of the pen and pencil Level of Supervision Inventory, an instrument designed to predict criminal reoffending. Although they found the validity of the interview technique satisfactory they concluded that "predictive validities were significantly enharnced by multimethod assessments" (p. 467) and that any predictive instrument, regardless of how it collects data, must be revised regularly to ensure its predictive validity remains stable over time.

3 Official records.

The third major source of data is official records such as the Uniform Crime Report in the United States or the Police Gazette or more recently, the Wanganui Computer in New Zealand. Official records tend to record only information that refers to a person's offending history or more specifically only the offences known to the police. Buikhuisen & Hoekstra (1974) voice their concern over the reliability and validity of data used in predictive studies that originates solely from official records. With the same thought in mind, Wilkins (1972) notes that the individual case records that often form the basis of prediction studies do not appear to have sufficient detail or accuracy and

the information obtained is susceptible to noise and redundancy. Also it is important that when developing a predictive instrument, attention is paid to the source of the data and the possibility of clerical errors in converting the raw data into a coding format for analyses.

9. Method.

9:1 Subjects

These data originate from an initial body of 395 offenders. The subjects were offenders convicted in the Christchurch Court, for a variety of crimes, during the period 1st June-to-31st August 1986. All people who were convicted in the courts during this period and on whom a Probation report was prepared, took part in the study. The sentences received by the subjects reflected the diversity of offences committed from minor violations of public order to violent crimes against the person i.e. rape, kidnapping and murder. Sentences reflected this diversity and ranged from convicted and discharged, to terms of imprisonment from less than one month to life imprisonment. The final population used in the analyses contains members which represented the full range of sentences avaiable with the exception of periodic detention, a life sentence.

The data from the 395 offenders has been subjected to a

number of exclusion criteria. This was to ensure the data used was from records that were complete and accurate. Only those protocols who met the following criteria were used in the final analyses.

1: They were records from persons convicted for offence(s) during the period 1st June to 31st August, 1986, in the Christchurch Court.

2: The Probation Officer had correctly completed and handed back the Social History Questionnaire (S.H.Q) (Riley,1986) (see Appendix 1).

3: The Criminal History records were available in a complete and acceptable form (in that there were no inaccuracies on the forms), from the Wanganui Computer Crimes Data Base, (people who were prosecuted by the Ministry of Transport have their records under a data base separate from the Police Crimes Data Base).

4: There was a period of up to one year, after the date on which the Questionnaire was completed, where the subjects had the opportunity to reoffend. The follow up period was two years from the time of the Questionnaire. Subjects that were imprisoned for this duration are excluded from the data.

Of the original 395 subjects, 268 (68.6%) subjects (39 or 15% female, 229 or 85% male) met all of the above criteria. The

age ranges from 63 years, to the youngest possible age at which a person can appear in the District Court in New Zealand, sixteen years and zero months with a mean age of 25 years.

Of the original sample the following subjects were rejected from the sample.

1. Seven were rejected for having incomplete S.H.Q's.

2: 59 were rejected on the grounds of having unmatched or unobtainable Criminal records. Alias names and false information resulted in several subjects having multiple prison identification numbers which made accurate identification of subjects near impossible.

3: Eight subjects were convicted and sentenced for the duration of the follow up period.

4: 53 subjects had committed traffic offences, thus their records were held on the Traffic Data Base and were unobtainable. These included some subjects that had committed both traffic and non traffic offences but who were prosecuted by the Traffic Department.

9:2 Procedure.

The Social History Questionnaire, (Riley, 1986) was the

instrument used to gather the initial data from which prediction of reoffending would be attempted. Criminal History Records available via the Rolleston Prison provided the follow up data.

1 The Social History Questionnaire.

The Questionnaire consists of two parts, the first parts consits of sixteen questions with possible responses being dichotomised into absent/present. This allowed for information to be collected in a fast and objective manner. The Questionnaire was designed to gather information on the subjects' social and demographic history at the time of preparing the pre-sentence report. The Questionnaire was designed on the basis of factors which had been consistantly reported to have been associated with reoffending in the criminal justice literature (Riley, 1986).

The second part of the Questionnaire was used by the Probation Office to record the Probation Officers' judgement as to the likelihood of the individual reoffending at least once within the next twelve months, if they are not in prison during this period. A scale of one to seven is used for this purpose.

The information contained in the checklist can be summarised into four categories;

1. Demographic data - this included variables such as age under or over 25 years, race (Polynesian or non-Polynesian), sex, less than three years education, unstable work record, income and employment status.

2. Family and realationship stability- whether or not the person had come from a disrupted famliy life, had been in the Department of Social Welfares' care and if they were in a stable relationship. The frequency of address changes was also measured.

3. Criminal record and history- Whether they were in court before the age of fifteen, three or more court appearances resulting in a conviction, and five or more total years imprisonment.

4. Social and psychological problems such as drug or alcohol addictions, psychiatric stability and gang affiliations.

The Questionnaire was completed by the subjects' Probation Officer, after they had been convicted of an offence(s) and a pre-sentence report was written. The method of data collection was a combination of the use of official records and direct interviewing.

All the statements were recorded in a simple dichotomous format where if the statement or situation applied to the subjects, the Probation Officer simply ticked the appropriate box. The final statement of employment status at the time of the interview was divided into six categories; full-time employment , temporary full-time, casual, Department of Labour Schemes, benefits, retired individuals and students. As with the other

statement variables the appropriate category was ticked. For the purpose of the analyses the work categories were later collapsed into two categories; those unemployed or on a form of benefit and all others.

For ease of data collection the Questionnaire contains identification information, including the subjects' name, prison record number, if available, date of birth, sex of the subject, the date the Questionnaire was completed and the number that the subject appears on in the Probation register. The nature of the offence(s) committed is also recorded on the form. Although the Questionnaire readily identifies the subject, this information was used only to obtain the criminal records, the Questionnaires themselves are confidential. No identifying material was used in the final analyses.

The Probation Officers' prediction is recorded as a tick on a scale of one to seven, where one represents the probability 'highly unlikely to reoffend' and seven 'most definitely will reoffend at least once' in the next twelve months.

2 Coding the Data.

Information on each subject was coded on three levels;

(i) the raw data from the Questionnaire, coded 0-1,

(ii) their offences as noted on their criminal history records and

(iii) a code which identified whether or not the subject has

reoffended within the follow up period.

1. The data relevant to the Social History Questionnaire, coded in a dichotomous format, where 0 indicates that the statement did not apply to the subject and 1 where it did. As mentioned previously employment at the time of the offence was broken down into six categories and coded on a one to six basis. The sex of the subject was the only dummy code used, where 1 equals male and 0 female. The actual age of the subject as of the time of the Questionnaire was recorded. The total number of variables entered into the analysis was eighteen; sixteen dichotomous variables plus the actual age and sex of the offender.

2. The criminal history of the subject, up to March 1988, was obtained via the Wanganui computer. For each offence recorded, the date, offence type and sentence received were coded. The relationship in time to the Index offence(s), the offence(s) recorded on the Questionnaire, was noted for each offence.

Offence type was coded according to the coding convention of the Police Code (Reprint Nov. 1985). The sentences received were recorded as time, in months, spent in prison and/or on probation. Sentences other than imprisonment or probation were nominaly coded;

a) 0= Corrective training, Borstal or Hospitalisation.

b) 1= Periodic Detention.

c) 2= Community Service.

d) 3= Fines.

e) 4= Reparation.

f) 5= Supervision.

g) 6= Disqualified from driving.

h) 7= Convicted and discharged.

i) 8= Defered sentence.

j) 9= Forfiture of goods.

Based on existing New Zealand law and Prison regulations it was assumed that a maximum of two thirds of any prison sentence would actually be served. The time assumed to be spent in prison is excluded from the twelve month follow up period. Therefore the twelve month follow up begins after the sentence for the Index offence(s) has been served, and refers only to the time in which the subject was free to reoffend.

To assess which individuals reoffended within the twelve month follow-up period, all of the subject's offences are coded with an identifier, that marks the offence(s) in terms of the relationship to the Questionnaire Index offence(s)

a) 0= All offences that were committed prior to the Questionnaire - past offending.

b) 1= The offence(s) noted on the Questionnaire - Index offence.

c) 2= Offences that occured within 12 months of the Index offence - defined the offender as a reoffender for the purpose of this study.

d) 3= All subsequent offences occuring after the 12 month period-

not statistically relevant information for this study as it represented the full term of the follow-up which did not allow for a standard time allowance for reoffending among all subjects.

3) In order to perform the discriminant function analyses an identifier that indicated whether or not the subject had reoffended subsequent to the Index Questionnaire offence(s) was needed. For the purpose of this study the subjects were categorised initially into three groups.

a) Those individuals that did not reoffend during the 12 month follow up period as defined above.
b) Those individuals that reoffended, but to a lesser degree, in that they committed an offence after the Index offence(s) but the nature of the offence was of a significantly lesser degree of seriousness. (see below for the criteria used to determine whether an offence was of a lesser nature).
c) Those individuals that reoffended to an equal or greater level of severity.

Individuals that had no opportunity to reoffend in that they were imprisoned throughout the follow up period as mentioned previously were deleted from the original data set.

Criteria for defining if a person had reoffended to a lesser degree

Four factors were considered in determining whether the person had reoffended to a lesser degree. The factors are given in a desending order of priority. The offender was judged initially by the first factor, if not relevant then by the second level of inquiry and so on. If the offender did not pass the first factor i.e. the second offence, first reoffence, was punishable by imprisonment, they were classified as a full reoffender. Criteria for a lesser offence are;

1: Imprisonment - The Index offence was punishable by imprisonment but the reoffence was not an imprisonable offence.

2: Type of offence - The reoffence was of a lesser degree of seriousness and did not involve violent crime against a person.

3: Number of reoffences - If a person had committed no more than two reoffences of a lesser degree of seriousness than the Questionnaire offence(s). For example is a person had originally committed ten counts of fraud and had reoffend on two counts of disorderly behaviour, if they past the other two factors as well they were classified as having reoffended to a lesser degree.

4: The form of sentence - For sentences other than imprisonment if the sentence received for a subsequent reoffence is of a reduced penalty such as convicted and discharged, than the original offence penalty it is decreed to be a lesser offence.

The Probation Officers prediction score (1-7) is recorded for the second half of the analyses which compares the prediction of the Probation Officers Score with the demographic and social history data. The second part of the analyses also examines whether adding the Probation Officers judgement to the demographic data significantly increased the predictive power of the Questionnaire.

9:3 Results.

An interobserver agreement was obtained as a reliability check for the criteria used to group the subjects into one of the three outcome groups. A reliability score of 91% was obtained (see Appendix 2), using a point-by-point agreement (Kazdin, 1982). The advantages in using this reliability check is that it assessed the interobserver agreement for each response trial, yeilding a more precise reading than a frequency/ratio measure.

The breakdown of the subjects into reoffending categories within the follow-up period were:

a) Number of subjects that did not reoffend = 41%. (n= 111)
b) Number of subjects reoffending to a lesser degree =10%. (n=27)
c) Number of subjects reoffending to a lesser or equal degree = 49% (n = 130).

A breakdown by sex of the subjects into two categories; those that reoffended and those that did not reoffend is as

follows.

Those that did not reoffended = 91 (40%) of the males and 20 (51%) of the females.

Those that reoffended either to a lesser degree, as defined above, or to a greater or equal degree of severity are 138 (60%) males and 19 (49%) females. It is interesting to note that in this sample of subjects more males than females reoffended this could be a reflection of the relatively small number of females in the sample.

The data was analysed using a series of Discriminant analyses. The rational for this was, that a discriminant analysis would readily identity those factors that significantly relate to reoffending. As the method and basis of Discriminant analysis has already been described it is not intended to repeat this but refer the reader to the statistical section (see Section 7:1).

Analysis of results.

1(i): All subjects with three criteria groups.

Table One shows the variables that met the criterion for inclusion into the discriminant function equation, with a final Wilks' Lambda of 0.79, $p < .05$. Of the eighteen variables included in the Questionnaire, with the combined data for males and females, only four variables significantly discriminated between the three criteria groups. These were; whether or not the subject was in a form of paid employment, the presence of a drug problem, gang affiliation and the age of the subject.

Table One. Variable entered into the discriminant analysis for all subjects with three criteria groups.

Step No	Variable	F-Value
1	Work	13.757
2	Drug	8.192
3	Gang	5.608
4	Age	5.330

A jackknifed classification analysis (see Table Two) tests the adequacy of the discriminant functions by providing a measure of the number of cases in the data that are correctly classified into each group, using the derived discriminant function equation.

Table Two Jackknifed Classification for all subjects with three criteria groups.

		Nos of Cases Classified into each Group		
Group	% Correct	Non-reoffenders	Lesser	Reoffenders
Non reoffenders	62.8	71	2	40
Lesser offenders	14.8	7	4	16
Reoffenders	71.1	35	4	96
TOTAL	62.2	113	10	152

The overall percentage of subjects correctly categorised is 62.2%, of this overall correct classification, the group that received the highest proportion of correct classifications is the

reoffending group 71.1%. The discriminant equation is least effective for classifying subjects into the group, reoffended to a lesser degree, with a correct percentage score of 14.8%. This can be partially explained by the small numbers of subjects that are in this group, (n= 27).

The mean age for all subjects in the sample is 25 years. A breakdown of the mean age by groups indicates that the average age of the subjects increases across the groups. For example, the average age of a person who is classified as a reoffender is 23.5 years, a person who reoffenders but to a lesser degree is 24 years and 27.6 years for a person who did not reoffend at all.

1(ii) Females subjects : three groups

Table Three indicates the results of the discriminant functions that classify a sample of women into the three groups (non reoffender, reoffending to a lesser degree and a reoffender) Only one variable was significant in discriminating between the groups, that of relationship stabiliy, F-value 5.261, Wilks' Lambda of .774, $p < .001$.

Table Three Variable entered into the discriminant function for Female subjects with three groups.

Step No	Variable	F-Value
1	Relationship	5.261

The Jackknifed classification (see Table Four) showed that the function correctly classified 92.3% of the group of reoffenders against 55% of the non-reoffenders.

Table Four Jackknifed Classification for female subjects with three groups

		Nos of cases classified into groups		
Group	% Correct	Non Reoffenders	Lesser	Reoffenders
Non reoffenders	55.0	11	0	9
Lesser reoffenders	0	1	0	5
Reoffend	92.3	1	0	12
TOTAL	59.0	13	0	36

The discriminant function was ineffectual in correctly classifying any subject into the group reoffending to a lesser degree, this was reflected in the overall correct classification for the three groups which was only 59%. This low overall correct classification figure is partially a reflection of the small F-value of 5.261 indicating that relationship stability though significant only accounts for a fraction of the total variance.

1(iii) Male subjects : Three groups.

A discriminant function with male subjects only, reveal similar significant discriminant variables as the combined data for males and females. It is interesting to note the change in

the strength of the variables as shown by the change in order that the variables are entered into the equation (see Table Five). The removal of gang association from the equation is to be expected given that gang association is predominantely a male activity and thus its variance as a predictor variable is largely a function of the sex of the subject variable.

Table Five Varaibles entered into the discriminant function for Male subjects only with three groups

Step No	Variable	F-Value
1	Work Record	12.270
2	Age	7.063
3	Drug	5.391

Table Six Jackknifed Classification for Male Subjects with Three Groups.

		Nos of cases correctly classified		
Group	% Correct	Non reoffenders	Lesser	Reoffenders
Non reoffenders	62.4	58	25	10
Lesser reoffender	38.1	6	8	7
Reoffenders	33.6	35	46	41
TOTAL	45.3	99	79	58

The jackknified classification analysis indicates that the discriminant function, using the three predictor variables, does not provide a very accurate prediction. Only 45.3% of the overall sample for male subjects were classified correctly using the discriminant function obtained. It is interesting to note that

the discriminant function is more accurate for the combined sexes than their individual breakdowns.

2 (i) All subjects with two groups.

The use of three criteria outcomes for the demographic data created a number of problems. While the use of the grouping, reoffending to a lesser degree, is more sensitive to the reality of the way in which a person indicates that they are moving away from a life of criminal behaviour only, a small number of subjects (n = 27, or ten percent) actually belonged to this group. By using a dichotomous approach, reoffending versus non-reoffending, a discriminant analysis equation provides more information on the differences between these groups can be derived.

In the second part of the analyses those subjects that were classified as reoffenders, and those classified as reoffending to a lesser degree, were combined into one group representing all subjects that had in some way or another reoffended in a manner that resulted in them being brought before the court during the follow up period.

The average age of all the subjects for the two criterion groups is similar to that of the three criteria groups (non reoffenders = 27.6 years; reoffenders = 23.5 years and all groups = 25.2 years). A breakdown by sex of the ages per groups is as

follows. In the sample the average age for a male reoffender is 23 years (n = 138) compared with 24 years (n = 19) for a female reoffender, for non reoffenders men average 28 years (n = 91) and women 26.05 years (n = 20), the average for both groups combined was 25 years for both sexes. The percentage of women in the sample that reoffened is 49% compared with 60% for male and 59% for the entire sample.

Of the eighteen variables that were in the data five met the criteria for entry into the equation with a final Wilks' Lambda (significance) of .78, $p < 0.05$ (see Table Seven). These variables were similar as for the equation using three criteria groups with the exception that "gang" was no longer a discriminating variable and race and number of prior convictions that the subject had were added.

Table Seven Variables entered into the discriminant equation for All subjects with Two groups.

Step No	Variable	F- Value	Wilk's Lambda
1	Work	27.378	0.909
2	Drug	16.414	0.857
3	Age	10.630	0.825
4	Race	8.131	0.801
5	Conviction	4.234	0.788

Work record or work stability appears to be the most powerful discriminant variable with an F-value of 27.378, $p < 0.05$, an examination of the F-values prior to any variables

being entered into the equation gives some indication of what other factors are loading on to the work stability variable. For example employment as of the time of the offence initially has an F-value of 8.36 after the first step in which work stability is entered this value drops down to 1.52 suggesting a relatively strong relationship between employment at the time of the offence(s) and the persons general work record.

Table Eight Jackknifed Classification for all subjects and Two Groups

		Nos of cases correctly classified	
Group	% Correct	Non reoffenders	Reoffenders
Non reoffenders	69.0	78	35
Reoffenders	72.2	45	117
TOTAL	70.9	123	152

Condensing of data into the two groups reoffenders and non reoffenders (see Table Eight) provides a much more powerfull predictive equation with a total of 70.9% of subjects being correctly classified into the appropriate category.

It is interesting to note that there is not a large difference between the means for work stability and employment at the time of the offence and the groups (see Table Nine). The mean for an unstable work record is .478 for non-reoffenders and .779 for reoffenders. With the exception of age which is a continuous variable, the closer the mean is to 1.00 the higher the incidence

of an unstable work record amongst the group. In that if all subjects who reoffended scored one for work stability, as opposed to zero on the dichotomous scoring format, then the mean for reoffenders on that variable would be one. The mean for employment at the time of the offence for non-reoffenders is .548 and .716 for reoffenders. The means for work record/stability for reoffenders and non-reoffenders are similar to that of the variable employment at the time of the offence, indicating that the subject employment status as at the time of the completion of the Questionnaire was a good representation of the subjects overall work record or stability.

Table Nine Means For the Variables Entered Into The Equation

Variable	Reoffenders	Non reoffenders	Average
Work	.487	.779	.658
Drug	.115	.389	.276
Age	27.628	23.556	25.229
Race	.177	.340	.273
Convict	.646	.827	.753

The initial F-value (which indicated the variance that each variable contributes to reoffending before any variables are taken out by the equation) for drug abuse is 24.33 compared with 0.82 for alcohol abuse. With the removal of the drug variance from the pool, the alcohol F-value rises slightly to 2.47. This figure then remains relatively constant throughout. The removal of the F-value for work stability reduces the variance for drug abuse considerably to 16.41 suggesting a relationship between

drug abuse and work stability and reoffending, where drug abuse is partially acting as a surpressed variable with work stability.

2(ii) Female subjects with two criteria groups.

Table Ten Variables entered into the discriminant equation for Female subjects with two groups.

Step No	Variable	F-Value
1	Relationship	10.580
2	Mental Stability	7.284

With the reduction of criteria groups to the dichotomous format, relationship stability remains as the first discriminant variable and mental stability is added to the function. Mental stability is the scorded negatively when a person indicates that they have been hospitalised for psychiatric treatment. As with the previous discriminant function analyses with the sample of women only, none of the predictor variables that were significant for the combined data were found to be significant variables for the women.

The jackknifed classification (see Table Eleven) shows that a relatively high percentage 79.5%, of subjects in this sample are being correctly classified using this equation.

Table Eleven Jackknifed Classification Female subjects With Two Groups.

		Nos of cases correctly classified	
Group	% Correct	Non reoffenders	Reoffenders
Non reoffenders	75.0	15	5
Reoffenders	84.2	3	16
TOTAL	79.5	18	21

2(iii) Male Subjects with Two Groups.

Work record, age, drug abuse, race and education were the five variables that met the criteria for entry into the discriminant function equation (see Table Twelve).

Table Twelve Variables Entered into the Discriminant Equation For Male subjects only with two groups.

Step No	Variable	F-Value
1	Work Record	24.534
2	Age	14.137
3	Drug	10.627
4	Race	6.169
5	Education	4.128

The first three variables, work record, age and drug abuse are the same as for the male subjects with the three criteria groups. Race, is the offender of Polynesian origin, emerges as a significant discriminating variable for all subjects with two

outcome groups. This is the first time that education, or the lack of education, emerges as a significant variable with an F-value of 4.123 wilks' lambda 0.781, $p < 0.005$.

Table Thirteen Jackknifed Classification : Male Subject Two Groups.

		Nos of cases correctly classified	
Group	% Correct	Non reoffenders	Reoffenders
Non reoffenders	67.7	63	30
Reoffenders	74.1	37	106
TOTAL	71.6	100	136

The percentage correctly classified as shown in Table Thirteen, though not as high as for the female sample is in line with the overall sample of 71%. This can be compared with 45% for the male sample with three outcome groups.

3: Addition of Clinical Judgement.

The probation officer's score on the likelihood that the subject would reoffend was added to the discriminant analysis equation. The scores ranged from one to seven where, a score of one indicated that the Probation Officer thought that it was highly unlikely that the subject would reoffend within the twelve month follow up period and a score of seven indicated that they would most certainly reoffend. The sample mean score for the non reoffender group was 3.50, S.D = +/- 1.42, and for reoffenders 4.80, S.D = +/-1.36. In the initial step before any variables had

been removed, the probation score has a F-value of 56.86, Wilks' Lambda 0.820, $p < 0.05$. The removal of this variable removes variance from a number of other variables including; age, sex, education, relationship stability, change of addresses, work record, income stability, juvenile offences, previous convictions, past imprisonment, drug abuse, D.S.W care and employment as of the time of the offence. This suggests that the Probation Officers' when predicting whether the subject was likely to reoffend either consciously or unconsciously included these variables in their decision making process. Table Fourteen shows the variables that were entered into the discriminant function.

The percentage correctly classified using this sample is slightly higher (73.2), than that for the sample of all subjects without the Probation Officers' judgement added (62.2) (see Table Fifteen).

Table Fourteen. Variables Entered into the Discriminant Equation all subjects with the Probation Officers Judgement

Step No	Variable	F-value
1	Judgement	56.864
2	Age	11.339
3	Drug	6.684
4	D.S.W care	4.266

Table Fifteen Jackknifed Classification for all data

		Nos of cases correctly classified	
Group	% Correct	Non reoffenders	Reoffenders
Non reoffenders	75.7	81	26
Reoffenders	71.4	44	110
TOTAL	73.2	125	136

The question of whether the use of the demographic data can provide any additional predictive information over and above what can be assertained by comparing the predictive power of the Probation Officers' judgement alone, the demographic data alone and the combined data. Table Sixteen gives the probability of a correct classifications for each of the three data sets as well as the canonical correlations (R^2). The canonical correlation is a measure of how well the variables combined in a linear fashion to predict the criteria variable in this case reoffending.

Table Sixteen Comparison of The Predictive Power of Three Data Bases

Data Base	Probability	Canonical Correlation
Judgement	.8201	.4231
Judgment + Variables	.7883	.4976
Variables	.7530	.4601

Not too much emphasis can be placed on the probabilities for correct classification as only one variable matrix (the judgement

only matrix) is being compared with matrices that are composed of nineteen variables (judgement plus eighteen questionnaire variables). With regards to the canonical correlation the higher the correlation the greater the degree of prediction. The effect on the canonical correlation, for the judgement only analyses, of the addition of the demographic variables gives a significant value of 23.33, where, $F(4,226) = 2.26$, $p < .05$. In reality this means that although both the Probation Officers' judgement and the demographic variables on their own are effective in predicting the likelihood of reoffending, their effectiveness is increased significantly when the variables are combined. A better prediction is attained when the Questionnaire is used in conjunction with the Probation Officers' score on the one to seven measure of the probability that a subject will reoffend.

10. Discussion.

On the surface the Social History Questionnaire is a useful instrument in the field of the prediction of reoffending. Essentially it is an instrument that it most effective when used as a tool or aid in conjunction with the experience and intuition of the Probation Officers in determining whether an individual is or is not likely to reoffend. If the results from this study are representative of other similar populations, it appears that Probabtion Officers already include the majority of the social history and demographic variables, used in the instrument, in their judgements. Though this is not to imply that the instrument is redundant, for it provides an objective standard format by

which a person's history is recorded as well as satistically highlighting the different weight each variable has with respect to it's predictiveness for reoffending.

Despite a number of methodological limitations certain conclusions can be drawn from the study. These conclusions, which have important implications for futher research in the field of criminal offending predictions, will be discussed further on. There are number of methodological limitations, some of which the author was aware of prior to the study. The following limitations can be noted.

1. The validation sample.

Predictive instruments are generally designed in two parts; an experimental sample which designs the instrument, and a validation sample which test the ability of the instrument to perform the task it sets out to do. Due to time constraints on this research it was decided that although the factor of shrinkage (the lose in predictive power as depicted by the validation sample) was very important, this study was only intended as a preliminary study to further research. It was felt that the issue of validation and consequent shrinkage was not of primary importance thus able to be examined at a later date. The Jackknifed classification provided an acceptable measure of the accuracy and stability of the discriminant function analysis for the sample under study and the purpose of the research (Tukey, 1969).

2. Encoding the data.

It is almost unavoidable that when a large mass of data are collected by a number of different people, and then this body of information is categoriesed and given to different people to enter onto a computer that the potential for errors is high. Two sources of error can be readily identified. Firstly the use of official records and information files to obtain criminal records and some background information according to Lab & Allen (1984) raise some issues about the validity of the data. Secondly the fact that a number of Probation Officers' filled in the Questionnaires gives scope for error. Each Probation Officer had their own interpretations of what questions the S.H.Q was asking and how to interpret the information that was given by the subject and the information files and records. Little can be done to reduced these sources of error so it is important that they are recognised and kept aware of at all times.

3. A reterospective study.

Like most contempoary predictive instruments the S.H.Q. is reliant on information on the offenders past history to predict future offending behaviour. While this relationship has proved to be a relatively strong and a stable one over the years it neglects a whole aspect of the persons life i.e. the present. More recent research has come to realise the value of subtle attitude changes often brought about by a significant person being introduced into that person's life. It is these personal changes that are seldom measured but may have a marked influence on a persons behaviour. It may prove beneficial for future studies to somehow measure and include these changes.

The results from this study highlight some important aspects of reoffending among a New Zealand sample of offenders. Although the study was an attempt to incorporate a diverse range of offenders and types of crimes commited by this group, by it's very design a sector of the criminal population was excluded. Those offenders that commit severe or violent crimes against the person were given sentences of such a duration that they were excluded from the follow up period. In order to examine the variables that are significant to this group in terms of reoffending a futher study looking specifically at this population needs to be conducted. The findings of this research then relate only to those offenders that were sentenced for property or minor offences against the person. This is not to negate the fact that some of this sample reoffended in a violent and severe manner.

The variables incorporated into the S.H.Q. were very effective in classifying reoffenders from non-reoffenders, when using only the two groups reoffenders and non reoffenders (70.9% correct classifications). Unfortunately it was not so effective when dealing with the three group classification, non-reoffender, reoffending to a lesser degree and reoffending to an equal or greater degree (62.2% correct classifications). Although this is disappointing it is to be expected given the small numbers of subjects in this group.

One of the major finding of this study was that men and

women follow different offending and reoffending patterns and that these patterns are governed by different variables.

Looking at the overall pattern of reoffending, 41% of the sample did not reoffend, compared with 49% that reoffended to some degree. Of those that reoffended, 60% of this group were men as opposed to only 49% female. The women that reoffended on average tended to be slightly older then their male counterparts (24 years for female reoffenders and 23 years for male reoffenders). However they also tend to stop reoffending at a younger age then men (26 years for female non reoffenders and 28 years for male non-reoffenders). Thus it appears that not only do fewer women reoffend, but of those that do reoffend the reoffending span is considerably shorter than for the male reoffenders. This in its' self has implications for the rational behind the methods of sentencing women and their rehabilitation needs.

The narrow age span for women offenders may partially explain why age was a discriminating variable for the combined sexes and for the sample of males only, but was not significant for the sample of women only. Most well cited studies tend to look only at samples of male offenders (Gendreau et al. 1979; Monahan, 1981), and have subsequently highlighted the importance of age as a burn out factor in reoffending. This study supports their findings in this respect but emphasises the importance in not assuming that those variables that are predictors for a male population will also be relevant for an offending female

population.

The five variables that differentiated reoffenders from non reoffenders using the total sample were; work record and stability, the presence of drug abuse, the age of the offender, whether the offender was classified as a European or Maori (including Pacific Islander), and whether they have had more than three previous court convictions resulting in imprisonment. These variables have all been shown to be related to reoffending in other Western countries, though it is disappointing to note that race is a discriminating variable in New Zealand. It is interesting that employment (or lack of) continually appears as the main predictor of reoffending throughout the study, with the exception of the female sample. It is surprising that this being the case, there is little research on the effects of providing employment for parolees and subsequent level of reoffending in New Zealand. Perhaps the issue of the growing level of unemployment needs to be seriously addresed by the Government of the day.

There are two distinct themes that emerge from a breakdown of the discriminant function analysis with the different sexes. The variables that appear to quite strongly differentiate reoffenders from non-reoffenders (79.5%, correct classification) within the female sample are relationship and emotional stability. Neither of these two variables surfaced as significant predictors for the male sample. Given that relationship stability

inparticular plays an essential role in determining whether or not a women reoffends, the wisdom of conventional custodial sentences that seperate and often destroy the family unit must be reviewed. Perhaps resourses would be more effectively spent on maintaining the family unity and stability and not in enforcing isolation, this may reduce not only the adult reoffending but the potential for the children in becoming first offenders.

A cult type factor for male reoffenders emerged from the analyses with the male offender described as holding an unstable work record, under twenty five, a drug user, of Maori or Polynesian decent and less the three years of secondary school education. These variables that predicted reoffending with 71% accuracy have all been previously identified with reoffending (Buikhuisen & Hoekstra, 1974; Koller & Gosden, 1980; Fifield & Donnell, 1980) and present a cyclic pattern that appears only to be broken with employment stability or increased age. With the female sample reoffending was connected on a personal level where with the male sample it was very much governed by a peer group factor. The presence of gang association was very strong within the overal sample but did not show up as a discriminating variable for the male sample.

The final point raised in the study was that Probation Officers already include a vast number of the social history and demographic variables, described in the Questionnaire, when forming their professional judgements on whether or not a person will reoffend. The combination of the Questionnaire with the

subjective judgement of the Probation Officers produced the highest degree of predictive power. The combination of an objective instrument such as the Demographic and Social History Questionnaire with subjective professional judgement represents a powerful and successful combination.

It is interesting to note that similar overseas studies that have combined a predictive instrument, such as the one used in this study, with clinical judgement based on psychometric test scores little to no additional predictive power has been achieved (Wormith & Goldstone, 1984; Gendreau et al. 1979). Perhaps the value gained from the subjective input, that has come from a grass-roots or working knowledge of criminal behaviour and exists as part of the Probation Officer's skills, is a more effective use of professional input. Clinical tests, used by some professionals and Parole Boards may not provide the same level of sensitivity to the data, with regards to likelihood of reoffending . If this is the case, greater weight must be given to information obtained from Probation Officers than has previously been credited. To be of value, future research needs to examine methods of how to best integrate objective information gathered by predictive instruments with the intuition and experience of those professionals that hold an active working knowledge of the field of reoffending.

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endix One: Social History Questionnaire. (Riley, 1986). No. [ ]

PROBATION RESEARCH DATA

Date: 2/8/86

Full Name [redacted] PRN D.O.B. [redacted] Sex M.

Current Offences Obstructs Police,
Possession of Prescription Medicine,

1. Please tick which of the following apply to the person reported o

These variables are as at the time of offence.	Tick
1. Under 25	✓
2. Polynesian	✓
3. Less than 3 years secondary education	✓
4. Not in stable relationship	✓
5. 3 or more addresses in last year	
6. Unstable work record	✓
7. No regular income	
8. Court appearance before 15 years old	
9. 3 or more court appearances (resulting in conviction)	✓
10. 5 years or more total imprisonment	
11. Current alcohol problem	Has alc
12. Current drug problem	[illegible]
13. Gang affiliation	
14. DSW institution more than 3 months	
15. Psychiatric hospitalisation	

16. Employment status at time of conviction

Full time work	Temporary Full-time work	Casual work	D.O.L. work scheme	Sickness, unemployment, D.P. Benefit	Othe
				✓	

commendation

2. Which of the following was (were) explicitly recommended in the report.

1.	Discharged without conviction	___	1. Not discharged without conviction ___
2.	Convicted & discharged	___	2. Not convicted & discharged ___
3.	Postponement, suspension of sentence	___	3. Not postponement, suspension of sentence ___
4.	Fine	___	4. Not fine ___
5.	Reparation	___	5. Not reparation ___
6.	Community Service	___	6. Not community service ___
7.	Supervision	✓	7. Not supervision ___
8.	Community care	___	8. Not community care ___
9.	Periodic detention	___	9. Not periodic detention ___
10.	Imprisonment	___	10. Not imprisonment ___
11.	Other (specify)	___	
12.	No recommendation	___	

3. Which of the following was (were) suggested (hinted at) in the report.

1.	Discharged without conviction	___	1. Not discharged without conviction ___
2.	Convicted & discharged	___	2. Not convicted & discharged ___
3.	Postponement, suspension of sentence	___	3. Not postponement, suspension of sentence ___
4.	Fine	___	4. Not fine ___
5.	Reparation	___	5. Not reparation ___
6.	Community Service	___	6. Not community service ___
7.	Supervision	___	7. Not supervision ___
8.	Community care	___	8. Not community care ___
9.	Periodic detention	___	9. Not periodic detention ___
10.	Imprisonment	___	10. Not imprisonment ___
11.	Other (specify)	___	

4. In your view, irrespective of any recommendation or suggestion in the report, which would be the best sentence(s) in terms of this persons interests. (i.e. in terms of their eventual rehabilitation)

1.	Discharged without conviction	___
2.	Convicted & discharged	___
3.	Postponement, suspension of sentence	___
4.	Fine	___
5.	Reparation	___
6.	Community Service	___
7.	Supervision	✓
8.	Community care	___
9.	Periodic detention	___
10.	Imprisonment	___
11.	Other (specify)	___

5. Would you please 'guess' the most likely sentence(s) for this per on whom the report was written.

1. Discharged without conviction ___
2. Convicted & discharged ___
3. Postponement, suspension of sentence ___
4. Fine ___
5. Reparation ___
6. Community Service ___
7. Supervision ✓
8. Community care ___
9. Periodic detention ___
10. Imprisonment ___
11. Other (specify) ___

6. In your opinion, how likely is it that this person will be convicted of at least one offence during the next twelve months (tick one)

Almost Certainly Not	Very Unlikely	Unlikely	Possibly	Probably	Very Probably	Almost Certainly
___	___	___	✓	___	___	___

7. In your opinion, how likely is it that this person will be convicted of at least three offences during the next twelve month (tick one).

Almost Certainly Not	Very Unlikely	Unlikely	Possibly	Probably	Very Probably	Almost Certainly
___	___	___	✓	___	___	___

8. Court: High Court ___
District Court ✓

9. Report Writer _____

10. Supervising Officer _____

11. Sentence _____

Appendix Two: Point-by-Point Reliability Score. (Kazdin,1982).

$$\text{Point-by point agreement} = \frac{\text{Agreement for trial}}{\text{Agreement + Disagreement}} \quad 100$$

$$\frac{72}{72 + 7} \quad 100 = 91\%$$